JOURNAL *of* EDUCATIONAL RESEARCH

Volume XII NOVEMBER, 1925 Number 4

ADDING UP OR DOWN: A DISCUSSION

B. R. BUCKINGHAM
Ohio State University

According to colloquial English idiom, we "add up" a column of figures. That is, if we want to find the sum of several items we say we "add 'em up." Even though we begin our addition at the top of a column, or at the left of a row, we still "add 'em up." Never do we say we "add 'em down." We may with perfect linguistic propriety *copy* them down or *set* them down, or *put* them down, but *add* them down we may not.

Students of language offer convincing reasons for our peculiar twists of speech. No reason, I should suppose, would be more satisfactory for uniting the adverb *up* with the verb *add* than the fact that people generally begin at the bottom of a column of figures rather than at the top. No doubt this is the explanation offered. It rests on the assumption that addition is—or was, at a critical period in the formation of the language—an upward process.

I intend in the following paragraphs to note the extent to which a certain group of people preferred upward to downward addition. I shall also look into the intensity of each person's preference, its supposed reasonableness, its origin, and its consistency. Moreover, since this is a discussion—the reader is referred to the title for verification—rather than a demonstration, I shall introduce some argument.

But first let us settle the question of the importance of this matter. Obviously preference must be given to the procedure which produces the better results. Narrowly considered, these results will be manifested in the facility and the accuracy with

which the addition is performed. If upward addition is conducive to greater speed and accuracy, the case would appear to be settled in favor of beginning at the bottom of a column and working toward the top.

On the point, however, of the results attained in the process itself, we have at the moment no convincing evidence. I have learned of some research on the matter which has not been published, but the only published account of an investigation with which I am familiar is the one by Cole.[1] This investigation, however, is by no means conclusive. It shows that downward addition is slower but at the same time more accurate than upward addition. Since the same report shows that counting backward is likewise slower but more accurate than counting forward, there is a suggestion that, when the process goes counter to the direction in which one is accustomed to go, the added attention to detail produces a more accurate result.

This apparently leaves quite out of account the question of whether downward addition would continue to prove less rapid and more accurate if it had been taught to children from the beginning. It seems, therefore, that a decision on this question can scarcely be reached by experimentation conducted with subjects, either children or adults, whose habits in the matter of addition have already become fixed. It appears that what we need is an experimental attack upon the question which will include as a part of its procedure a method of teaching. In order that such a teaching procedure may be applied, it will likewise be necessary that the experiment be carried out upon children who have not yet learned to add columns of figures. What we should like to do would be to introduce a controlled experiment at that point in the course of study where, after the children have learned the basic addition facts, they first begin to apply these facts in the addition of three or more numbers.

But one may raise the question: Is this worth while? Does it matter whether we teach children to add upward or down-

[1] Cole, Lawrence E. W. "Adding Upward and Downward," *Journal of Educational Psychology*, 3:83-94, February, 1912.

ward? The result is the same, and it is quite within the bounds of probability that neither method will show a consistent superiority over the other, either in the accuracy of the result or in the facility with which it is obtained.

But the immediate result is not the whole question. I wonder if our experimental attack upon this or that question in education is not too often dominated by a partial and incomplete view of the particular matter in hand. Education is a unitary process. To be sure it is made up of many processes, but none of these exists unto itself. We do not, for example, seek the complete justification for segregating feeble-minded children in the progress which these children themselves make when segregated. The larger question involves not only the growth of the segregated children but the growth of the children from whom they are withdrawn. Even in the field of arithmetic a full view of the value of the take-away or the additive idea in subtraction will not stop with the subtraction of integers but will include subtraction of fractions and denominate numbers. Indeed, it will go beyond the process of subtraction and include division as well.

It is possible, therefore, that the question of adding upward or downward will obtain a part of its importance from considerations other than the accuracy or facility with which the operation is performed. I am anxious at this point not to be misunderstood. I do not mean that the primary consideration in this connection is something else besides the speed and accuracy with which correct sums are obtained. All I mean is that this is not the whole question.

Consider, for example, the studies which have been made during the past few years regarding the distribution of practice in textbooks and other teaching materials—studies which have shown the extremely unequal distribution of practice among the different basic combinations. As a result of these studies various attempts have been made so to distribute the repetition of number facts as to secure a more favorable opportunity to learn. An author of a textbook or of a set of practice material strives

to introduce 7 plus 9 as often as he does 3 plus 2. But in order to do this he must make certain fundamental assumptions. Consider, for example, this column of numbers:

7
8
2
—

If one is scoring the frequency with which addition combinations occur in a given set of material, he will score the combinations involved in the above column differently according to whether he assumes addition to be upward or downward. If upward addition is assumed, there are in this example the combinations 2 plus 8 and 10 plus 7. On the other hand, if downward addition is assumed, two quite different combinations result, namely, 7 plus 8 and 15 plus 2.

Now one of the big questions in connection with the preparation and use of teaching materials is the question of controlling the distribution of practice. This offers no argument, in the case of column addition, for either an upward or a downward process. It does, however, offer a forcible argument for a decision one way or the other. Of course if experimental evidence gathered in connection with the actual teaching of column addition shows that either direction is superior to the other, then the decision is made. In that event those who write our textbooks will assume the direction which the evidence supports and will control practice on the basis of that assumption. Again, therefore, it appears that the determination of this question is important and that it rests, or should rest, upon experimental evidence derived from actually teaching column addition.

There is another angle to the question. If there is a pronounced preference among people in general for either upward or downward addition, this pronounced preference should have no small weight in influencing our decision as to school practice. If, independently of the way they are taught, people "just naturally" fall into "adding 'em up" then there is probably a fundamental reason at the bottom of their action. Under these cir-

cumstances we ought not to advocate the opposite procedure unless the evidence—evidence, that is, relating to speed and accuracy—is very strongly in opposition to the general practice.

With the idea of finding out something about this general practice, I asked about five hundred students in teacher-training institutions the following question: "When you add a column of figures, do you usually go up or down?" These students were enrolled in the 1925 summer sessions of Ohio University, Miami University, the Kent State Normal College, the Bowling Green State Normal College, Ohio Northern University, and the Ohio State University.[2]

Returns were received from 493 students. Most of them had had teaching experience. The number who preferred to add up was 303; the number who preferred to add down was 190. Approximately, therefore, the vote is 3 to 2 in favor of upward addition. There is some slight evidence to the effect that students who have had no teaching experience have a stronger preference for adding upward than have experienced teachers. Among 64 students, none of whom had taught, 44 indicated that they usually added upward, while 20 expressed the opposite preference. The vote was thus more than 2 to 1 in favor of upward addition. One hesitates to press conclusions on such slender foundations, but there is here a suggestion that after persons have had teaching experience they tend to adopt downward addition as a preferred method. This suggestion is rendered more plausible by some additional data to which I shall refer in a moment.

Whether the reader will think that a vote of 3 to 2 is conclusive for upward addition depends somewhat upon his intellectual makeup and perhaps still more upon his own predilection in reference to column addition. To me the case for upward addition seems to be rather weak when only 3 persons out of 5 prefer it. This impression is strengthened when we come to consider another question which these students answered. This was,

[2] My thanks are due to Professors Morton, Guiler, Manchester, Overman, Darnell, and Brim of these institutions for their assistance in securing the material used in this report.

"Do you find any embarrassment in going the other way?" The reader will bear in mind that this question followed immediately after the one in which the student was asked whether he usually added up or down and that the student had just written the word "up" or the word "down," according to his preference. Of the 493 persons who answered these questions, only 69 stated that they would be embarrassed to reverse their preferred direction. The remaining 424 answered "No" to the second question. They thereby indicated that to them the direction in adding a column of figures was more or less a matter of indifference.

TABLE I. PREFERENCE AND INTENSITY OF PREFERENCE

Prefer Adding	Embarrassed to Add the Other Way		Total
	Yes	No	
(1)	(2)	(3)	(4)
Up	44	259	303
Down	25	165	190
Total	69	424	493

Table I indicates in further detail the distribution of the answers to the second question. I regard the results from this question as indicating the intensity of the preference which these students expressed either for the one or the other method of addition. It appears that only about 14 percent of the students prefer their chosen method to the point of being embarrassed by using the opposite method. A slightly greater proportion of those who prefer adding up than of those who prefer adding down are embarrassed when called upon to go counter to their preference. The figures are 14.5 percent for those who prefer adding up and 13.2 percent for those who prefer adding down—a difference which, though probably of little statistical significance, does serve in connection with other matters to suggest a greater rigidity on the part of those who add upward.

Suppose, now, we combine those who express a preference for one method with those who, while preferring the opposite method, are apparently quite comfortable in using the other. There is some justification for doing this. Here, for example, are 303 persons who say they prefer to add upward, but there are also 165 persons who, while preferring to add downward, are not embarrassed when called upon to add upward. If such is the case, we have 468 persons who will experience no difficulty in "adding 'em up." On the other hand we have 190 persons who prefer adding downward; and to these we may not inappropriately add 259 more who, though preferring to add upward, can go the other way without embarrassment. This gives us 449 persons who have no difficulty in "adding 'em down." From this it appears that adding up or down is pretty much a matter of indifference so far as these students are concerned.

TABLE II. OPINION AS TO REASONABLENESS OF PREFERRED METHOD

Prefer Adding	Think More Reasonable	Do Not Think More Reasonable	Total
(1)	(2)	(3)	(4)
Up	156	147	303
Down	104	86	190
Total	260	233	493

The students answered a third question: "Do you think your preferred method is the more reasonable?" Table II shows the distribution of replies. Of the 493 students, 260, or a little more than half of them, not only had a preference as to method but believed they were right about it on the basis of its reasonableness. The downward adders were apparently a little more sure of this than were the upward adders. The 104 who thought their downward addition was the more reasonable constituted 54.7 percent of all those who preferred moving from the top downward when they added a column of figures. On the other

hand, the 156 who thought their upward addition was the more reasonable amounted to only 51.5 percent of the entire group of upward adders. The difference between these two percents is small, as was also the difference between the percent of upward adders who were embarrassed to go the other way and the percent of downward adders who were similarly embarrassed. The two percentage differences, however, support each other rather interestingly. They suggest, first, that the downward adders are a bit more flexible in their adjustments, and, second, that their preferred method rests to a greater degree on a rational basis.

This latter suggestion is supported by the responses to the fourth question: "Do you think you use this preferred method

TABLE III. EXTENT TO WHICH THE PREFERRED METHOD WAS THE RESULT OF TEACHING

Prefer Adding	Use the Method Taught	Do Not Use the Method Taught	Total
(1)	(2)	(3)	(4)
Up	219	84	303
Down	120	70	190
Total	339	154	493

mainly because you were taught this way?" Table III analyzes the answers to this question and shows the extent to which the preferred method is apparently the result of teaching. Of the 493 respondents to this question, 339 declared that they believed their preference to be the result of the way in which they were taught. Expressed in percentage form, this amounts to 68.8 percent. Evidently the preference exhibited by teachers and by students who are preparing to be teachers runs back to the method they were taught in childhood. At this point, another difference arises between the upward adders and the downward adders. The 219 of the former who use the method they were taught constitute 72 percent of those who prefer upward adding. The 120 downward adders constitute only 63 percent of their group. This difference still further suggests the in-

dependence of the downward adders. The small percents to which we have referred above begin to take on meaning. The downward adders are not as embarrassed as the upward adders in reversing themselves. They rest their method, or think they do, more frequently on the basis of reason. And now we find that they more frequently go counter to their early teaching. Those who add downward apparently tend more strongly to adopt their preferred method without reference to the way they were taught and in closer conformity to independent judgment.

As a somewhat interesting commentary upon the prevalence of upward and downward addition the returns of the fifth question may be referred to. This question was: "Do you read

$$\begin{array}{r} 5 \\ 3 \\ \hline \end{array}$$

'five and three' or 'three and five'?" As a matter of consistency one would expect that downward adders would read this expression "five and three" and that upward adders would read it "three and five." This, however, is not the case with any consistency. Of the 547 respondents to this question 408, or about 75 percent, indicated that they read the expression downward. In other words, a majority prefer upward addition while a majority read this example downward. In still other words, a majority add a column of figures upward when the column is tall but add downward when it is short.

The net result of all this appears to be, in the first place, that the preference for upward addition which the very phrasing of our language suggests is, after all, not nearly as strong as might at first be supposed. In the second place, the preference for upward addition, where it exists, is not incompatible with a reversal of the movement when occasion arises. In the third place, there appears to be some reason to believe that downward adders have arrived at their preference by a more independent process of thinking.

Apparently, therefore, the field is wide open for an experimental attack upon the relative value of these two methods of

column addition. There is no strong prejudice in the way. Among teachers—if these respondents are typical—only 3 out of 5 prefer one method to the other and most of those who indicate a preference are apparently open-minded on the question. If, therefore, either method is superior to the other, in the ease with which it may be used or in the accuracy of the result it secures, then there would appear to be little difficulty in "following the figures where they lead."

I have said above that the downward adders appear rather more frequently than the upward adders to have arrived at their preference through independent reason. In many instances the reasons which have led people to prefer downward addition have been given. Some of them may be briefly stated.

1. In downward addition the eye moves in the direction of ordinary reading. We have seen above that the majority of teachers read a two-figure combination downward. A sign in front of a store, if it is vertically placed, reads downward.

2. We write figures downward. Nobody begins to write a column of figures at the bottom. Again, therefore, the downward movement is more in consonance with practice.

3. If one adds from the top down, one arrives at the point where the figure is to be written precisely at the moment when the sum is secured. If one adds upward one arrives at the sum and must then come back to the foot of the column to write it. This introduces error.

4. If one is adding numbers of more than one digit and must therefore "carry," upward addition introduces a rather complex series of eye-movements. One goes up the units column, getting, let us say, 38 as the sum. One then goes back to the foot of the units column and writes the 8. Often children, or even adults not used to adding, go back to the top of the tens columns and write the 3. (There is no room at the bottom.) Then if one is going to add upward, it is necessary to go back to the foot of the tens column to begin. This is a sort of tumble-bug process that can scarcely fail to cause inaccuracy—at least

it *looks* so from an a priori point of view. Experiment may prove otherwise.

5. Downward addition lends itself more readily to certain analytical devices which have been advocated as remedial measures to employ when children exhibit pronounced weakness in column addition. For example, a notched card, used to bring to view successive combinations in a column, works better where it is moved downward.

These are some of the principal reasons which have been urged for downward addition. The reader might expect a similar list of reasons for upward addition. Truth to say, however, I have failed to receive any—except the reason that more people do it. We have already seen to what extent this reason prevails.

The real need now is for an experimental attack upon the question to see whether under controlled conditions children learn more quickly and more satisfactorily by one method than by the other. An experiment of this sort is being conducted and may form the basis of a subsequent paper.

THE ETHICS OF THE TEACHING PROFESSION

J. Orin Powers
University of Minnesota

Teaching differs from other professions in that its national organization has adopted no code of ethics comparable to the "Principles of Medical Ethics" adopted by the American Medical Association or the "Canons of Ethics" of the American Bar Association.[1] A number of state teachers' associations, however, have formally adopted such codes and several articles have appeared in educational literature, discussing or outlining codes of ethics for teachers. It is the purpose of this article to summarize all the available material that bears directly upon the topic.[2]

A preliminary examination of the codes and articles revealed two types not clearly differentiated. One type is a discussion of principles underlying professional conduct in which definite rules for conduct are mentioned incidentally or as illustrations. The other type is predominately a statement of rules for professional conduct. The code adopted by the New York State Teachers' Association is an example of the former; the Alabama Code is an example of the latter.

The codes of ethics analyzed comprise all the codes available. Twelve were adopted by state teachers' associations and three by local teachers' clubs. The state codes were adopted by Alabama, 1909; Virginia, 1913; New Jersey and New Hampshire, 1914; New York, 1916; Massachusetts, 1917; Michigan and Mississippi, 1918; Pennsylvania, 1920; California, Iowa, and Utah, 1923. The municipal codes were adopted by the Levana Club of Worcester, Massachusetts, in 1916 and by the Batavia, Illinois, and Cincinnati Teachers' Clubs in 1922. Codes not spe-

[1] Other professions whose national organizations have adopted codes of ethics are: dentists, pharmacists, mechanical engineers, civil engineers, electrical engineers, architects, accountants, and credit men. See *Annals of the American Academy of Political and Social Science*, vol. ci, no. 190, May, 1922. pp. 254-300.

[2] *See* bibliography.

cifically prepared for teachers are omitted from this analysis although they include much in common with teachers' codes. Among these are the "Code of Professional Ethics" adopted by the Superintendents of Minnesota in 1924 and the "Code of Ethics for Superintendents" adopted by the Illinois City and Town Superintendents' Association in 1912.

The articles[3] selected for analysis are those which directly discuss ethics for teachers or some problem connected with it. General statements of qualities desirable in teachers or of attributes of successful teachers are omitted. As with the codes, articles which bear upon ethical problems for superintendents or other administrative or supervisory officers are omitted.

The method of analysis consisted of five steps. The first was an examination of the codes and articles to determine the nature of the principles and rules of conduct contained therein. The term "principle of conduct" is here interpreted as a general statement of fact or relationship which serves as a standard for conduct but does not prescribe or define any specific conduct. A "rule for conduct" designates a particular activity as professional or unprofessional. Theoretically all rules of conduct are based upon one or more principles. The second step was a statement of these principles and rules as briefly as was consistent with the concepts appearing in the codes themselves. The third step was a classification of the rules for conduct according to their relationships; the fourth, a reduction to convenient captions of the statements formulated in the second step; and the fifth, a determination of the frequency of occurrence of the principles and rules in the codes and articles.

Since it is reasonable to assume that rules have been formulated from difficulties that have arisen in practice, the frequency rating derived may be taken both as a measure of the importance

[3] The writers of the articles analyzed are probably all engaged in some form of educational work. Ten are in colleges or schools of education or in normal schools; seven are, or were at the time of writing, superintendents of schools; one is the wife of a superintendent and was formerly a teacher. The official position of three of the writers is not designated in connection with their articles.

of the various principles and rules and of the extent of agreement among the codes and writers as to what constitutes professional and unprofessional conduct. The results appear in the tables presented herewith. Fifteen codes of ethics and statements from twenty-one articles or books on the subject yield the following six principles. Their frequencies of occurrence in each source are indicated:

Principles of Ethics	In Codes	In Authors' Statements
Preparation	7	15
Compensation	2	3
Social service	4	10
Obligation to pupils	5	3
Cooperation	0	6
Professional spirit	3	8

From these same sources the rules of ethics for the teaching profession were gathered and are summarized in Table I. Activities in which the teacher should not engage are given in italics.

Principles

An adequate statement of principles underlying professional conduct would comprise a definition of all the ideals of the profession. Obviously such a definition is impossible. In Section I of the "Principles of Medical Ethics" of the American Medical Association the following statements appear: "The practice of medicine is a profession." "In choosing this profession the individual assumes an obligation to conduct himself in accord with its ideals," and in Article II of the "Canons of Ethics for Lawyers" adopted by the American Bar Association we find "No code or set of rules can be framed which will particularize all of the duties of lawyers in the varying phases of litigation or in all of the relations of professional life. The following canons of ethics are adopted by the American Bar Association as a general guide. . . ." In teaching, as with these other professions, the codes and articles show the necessity for the

TABLE I. THE FREQUENCY WITH WHICH THE VARIOUS RULES OF ETHICS APPEARED IN THE FIFTEEN CODES AND THE STATEMENTS OF TWENTY-ONE AUTHORS

	In Codes	In Authors' Statements
SECURING A POSITION—		
1. *Advertise by innuendo*	3	2
2. *Apply unless there is a declared vacancy*	10	7
3. Demand an adequate compensation	3	8
4. *Bid or underbid for position*	3	5
5. *Issue or use indiscrimate recommendations*	3	1
6. *Use political, religious, etc. influence*	5	4
7. Use teachers' agency as a last resort		2
8. *Accept a position under adverse conditions*	2	4
9. *Seek an offer elsewhere for the sole purpose of securing advancement in present position*	1	3
10. Withdraw outstanding applications when a position has been accepted	2	3
PARENTS AND PUPILS—		
1. Treat the pupil as an individual	5	6
2. *Discuss deficiencies to embarrass*	3	2
3. *Accept remuneration for tutoring own pupils*	4	1
4. Appriae the public if the rights of children are being denied	5	2
5. Exercise especial care for helpless, indigent, and ignorant	1	1
6. Meet criticism with patience, courtesy, and open-mindedness	4	2
THOSE IN AUTHORITY—		
1. Practice confidence in, cooperation with, and sincerity towards	10	10
2. Attend faithfully to all duties assigned	5	4
3. Support the definite policies of the school	2	2
4. *Break a contract*	14	11
5. *Violate official correspondence or conversation*	2	1
6. *Violate the principles of line organization*	4	3
THE PROFESSION OR MEMBERS THEREOF—		
1. Maintain a high standard of morality, courage, and justice	6	8
2. Be a progressive student of education	15	10
3. Make available the results of research	9	3
4. Exhibit a courteous treatment toward members of the profession	13	7
5. Condemn and fearlessly expose unprofessional or immoral conduct within the profession	7	4
6. *Decry the profession*	3	5
7. Encourage the fit to enter the profession	2	2
8. *Use the profession as a stepping stone to another vocation*	2	7
9. *"Talk shop" in the presence of strangers or laymen*	2	1
10. Defend members unjustly attacked	2	
THE PUBLIC—		
1. Conform to the standards of the community	1	3
2. Participate in community affairs	8	9
3. Place the public good before personal gain	6	6
4. Refrain from undue political ambitions	2	1
5. Resent unwarranted interference by a layman	1	3
THOSE COMMERCIALLY INTERESTED—		
1. *Accept favors from commercial men*	3	1
2. *Act as agent for or receive commission or royalty on textbooks or supplies*	1	3

teacher himself to apply general principles in some specific matters of professional conduct. These principles vary but slightly from those of other professions.

PREPARATION—

The members of the profession are in possession of a body of scientific and technical knowledge and corresponding skill essential to the welfare of the community. Admission to the profession is gained by acquiring this knowledge and skill. It is clearly implied and sometimes stated that there is a monopoly of this knowledge and skill which precludes the practice of the profession by a layman.

COMPENSATION—

Compensation should be sufficient to enable its members to render most efficient service. This is the logical correlate of the first principle. In order to render most efficient service the professional man or woman must live upon a scale befitting his social position and must make reasonable provision for professional improvement. Compensation includes secure tenure of office, rising salary with increased experience, pension in case of disability, the costs of needed professional books and magazines and of memberships in and attendance at the meetings of professional organizations. The living wage should be sufficient to cover living expenses for twelve months. A teacher should not be obliged to engage in other pursuits in order to supplement his wage from teaching nor should he be obliged to accept favors from those commercially interested.

SOCIAL SERVICE—

Professional work must always be performed as a social service. It is essential to professional work that it render a service to society rather than to the personal gain of an individual. The teacher is primarily a servant of the community, not of his superior officer or any individual of the community. This service must be rendered without regard for matters upon which individuals may honestly disagree, such as religion or politics. Since the teacher is himself a member of the community, his own comfort and convenience must be secondary to the public good.

OBLIGATION TO PUPILS—

The highest obligation of every member of the profession is due to those who are being taught. This is referred to as "the fundamental ethical principle of the profession. . . . Every disputed or doubtful point in connection with any other ethical principle should be settled by determining which mode of settlement best meets the obligation asserted in this first principle."[4]

[4] Chambers, G. G. "Codes of Ethics for the Teaching Profession." *Annals of the American Academy of Political and Social Science*, vol. ci, no. 190, p. 123, May, 1922.

COOPERATION—

Teaching is a cooperation that takes into account the interests of all of the human factors involved, the board of education, the superintendent and other administrative and supervisory officers, parents and pupils, and the community at large. The teaching service is not rendered exclusively by teachers. The home especially is a most efficient copartner in rendering this service.

PROFESSIONAL SPIRIT—

The teacher's attitude is dominated by a professional spirit. The term "professional spirit" is used in a number of connections but particularly in reference to the spirit of social service as a distinguishing mark of the profession. As applied to the teacher it implies an appreciation of what constitutes professional and unprofessional attitudes and conduct.

RULES

IN RELATION TO APPOINTMENTS AND PROMOTIONS—

1. A teacher should not advertise by innuendo, exploitation, or personally inspired complimentary press notices. The teacher's best advertisement is a well-merited reputation for professional ability, acquired through service. Advertising through the customary channels, by exploitation, or otherwise, tends to lower the public's estimate not only of the teacher but also of the profession.

2. A teacher should not apply for a position unless a vacancy has been declared officially by the employing agency or by the incumbent. A teacher should not apply indiscriminately by the promiscuous circulation of form letters to boards of education. A teacher should not try to create a vacancy by remarks intended to undermine the incumbent. This rule does not preclude addressing letters of inquiry to proper officials.

3. When accepting a position a teacher should demand adequate compensation. Adequate compensation should include all that is mentioned under the second principle; it should be remembered that it is unprofessional under any circumstances to accept less.

4. A teacher should not bid or underbid for a position. This rule implies that the salary a given position should pay is to be determined by other considerations than the teacher's willingness to accept. A common practice of bidding among teachers would undoubtedly tend to lower salaries to the detriment of the profession.

5. A teacher should not issue or use indiscriminate recommendations or testimonials. The reasons for this rule do not appear in the codes. Stated positively, recommendations should be of a particular teacher for a specified position.

6. A teacher should not use political, commercial, fraternal, or family relationships as a means of securing a position. There are two apparent reasons for this, namely, that professional merit should be the

sole basis for appointment, and that the use of such relationships might obligate the teacher in a way that would interfere with the performance of duty.

7. A teacher should use the services of a teachers' agency as a last resort. The Pennsylvania Code definitely recognizes a function of the teachers' agency in making known to proper authorities the qualifications of a candidate. The rule is apparently directed at abuses of professional relationships by teachers' agencies. Suzzallo in 1913 advocated their ultimate elimination.

8. A teacher should not accept a position if the conditions are such that there is little likelihood of success. Conditions mentioned are: restrictions to which no self-respecting and ambitious teacher can subscribe; a vacancy created under such conditions; or conditions that would restrict the personal liberty of the teacher. This means essentially a boycott on these positions.

9. A teacher should not seek an offer elsewhere for the sole purpose of securing an increase in salary in his present position. There is no inference that the teacher may not use an offer as an argument for increased salary. The implication is that in case no increase is forthcoming or if the increase is disproportionate the teacher should be ready to accept the offered position.

10. Upon accepting appointment in a given district a teacher should notify all other districts to which letters of application have been sent. This simple and dignified courtesy on the part of teachers should lead to an equal consideration on the part of boards of education holding applications under consideration.

IN RELATION TO PUPILS AND PARENTS—

1. A teacher should treat the pupil as an individual, not as a class. His relationship to his pupils is one of personal interest characterized by a humane and gentle attitude. He should exercise fair and impartial justice to pupils without regard for the social or economic conditions of their parents.

2. A teacher should not discuss the physical, mental, moral, or financial limitations of pupils in such a way as to embarrass them or their parents. This rule implies a confidential relationship between the teacher and his pupils in accordance with which he will not discuss their weaknesses publicly.

3. A teacher should not accept remuneration for tutoring pupils in his own classes. It is assumed that the teacher will perform all the functions of teaching without special remuneration. Such remuneration would obligate the teacher to a particular pupil.

4. A teacher should apprise the public if, to his definite knowledge, the rights of children are being denied. This rule recognizes the public as a proper court of last appeal when conditions necessary to the highest efficiency cannot be obtained by other means. At all times the

teacher should try to educate the public to the needs and problems of the profession.

5. A teacher should exercise especial care for the helpless, indigent, and ignorant. This rule applies particularly to pupils in one's own classes.

6. Teachers should maintain cooperative relations with parents and should meet criticism with patience, courtesy, and open-mindedness. There is no implication that the teacher should place the judgment of parents above his own but he should welcome frank and constructive criticism.

IN RELATION TO THOSE IN AUTHORITY—

1. A teacher should practice confidence in, loyalty to, cooperation with, and sincerity towards those in authority. This rule implies that the teacher should know specifically his place in the school system and should cooperate harmoniously with all the existing agencies for the good of the child. The teacher should respect the good name of school officials both in private and public acts and should criticise only to help and improve. Criticism should be made to the person at fault or to his superior, with full expectation that the one criticised will have opportunity for explanation and defense of his acts. Adverse and unfounded public criticism of associates in office or of predecessors is especially condemned, since no possible good can come of it. On the other hand, present deficiencies of pupils are almost certainly not due to treatment at the hands of co-workers or predecessors. A teacher who has knowingly been assigned to deficient pupils should consider that fact a compliment to his professional skill.

2. A teacher should attend faithfully and promptly to all duties assigned. This apparently superfluous rule implies that the teacher will not question the wisdom of the assigning agency if that agency is a superior officer. A teacher should not be absent from duty except for very grave reasons. It is specifically mentioned that a teacher should leave adequate records and reports for a successor.

3. A teacher should support the defined policies of the school. This rule implies that teachers may, collectively if need be, demand the privilege of collaboration and cooperation in forming the school policy if such privilege is not voluntarily granted. Once a policy is thus democratically determined it should be loyally supported by all.

4. A teacher should never break a contract. There is apparently no equivocation in the codes or in the opinions of the writers upon this rule. The teacher should know the law of contracts and especially the provisions of his own contract. It is recognized that the nature of a teacher's contract is such that it may be enforced by law upon boards of education but not upon the teacher. There is an agreement that no contract should be made or accepted that does not contain a provision for termination upon due notice and for good cause. What constitutes a good cause is not entirely clear. Marriage of women and a substantial

promotion are mentioned. Suzzallo states, "Contracts are mere fiscal arrangements for service which do not imply a period of indenture wherein the freedom of movement of the teacher is interfered with." Patterson specifies thirty days as a reasonable time within which to terminate a contract. Nevertheless there is a general opinion that unless the consent of the employing agency is obtained the contract should be fulfilled. A strike or walkout is a violation of contract and therefore unprofessional.

5. A teacher should not violate official correspondence or conversation among teachers or with school officials. Stated positively, official correspondence is confidential unless definite permission to quote is granted.

6. A teacher should not violate the principles of line organization. This rule implies that a school system should have a line organization and that the teacher should be familiar with it. Line organization for schools recognizes the superintendent as the official head of the school system and the teacher's immediate responsibility to the principal under whom he is working. All suggestions or complaints should be made to the official next in rank although if satisfaction is not attained and the merits of the case warrant it, appeal should be made to a higher official, and ultimately to the community, due notice of such intent having been given to all officials concerned.

IN RELATION TO THE PROFESSION OR MEMBERS THEREOF—

1. The teacher should maintain a high standard of morality, courage, and justice. It is implied or stated that the teacher should be a moral, intellectual, physical, and spiritual example to pupils. This rule means that something more is expected of a teacher than of a layman or a laborer in another cause; more than the teacher's immediate necessity requires. For example, a teacher should be neat and cleanly in person even beyond the demands of hygienic and social considerations.

2. A teacher should be a progressive student of education. This rule implies an open-mindedness towards educational theories and practices, especially new movements in education. The means suggested are the reading of current educational periodicals and books, attendance at and participation in educational meetings, experimentation, attendance at summer schools, and travel.

3. A teacher should make available the results of his own research. This includes ideals, methods, plans, and devices successfully tried out. Recognized educational periodicals or books are the proper means of communication.

4. A teacher should treat members of the profession with courtesy. This takes various forms of expression in the codes: frank and open dealings in a business way; candor and civility in professional communications; safeguarding the moral, social, and religious reputation of fellow teachers; or withholding harmful information in regard to a fellow teacher while such teacher is under contract. One code (Ala-

bama) specifies it to be the duty of teachers to show care and favor to the families of deceased teachers, especially in the education and employment of their children. The same code decrees that teachers reply to all letters from a fellow teacher if postage is enclosed.

5. A teacher should condemn and fearlessly expose unprofessional or immoral conduct, including inefficiency, within the profession. This is the legitimate means whereby teachers may purge the profession of the unworthy and the unfit. Such condemnation and exposure should be made to proper officials and to the public if necessary. The application of this rule should not conflict with the rule immediately preceding.

6. A teacher should not decry the profession of teaching. This includes speaking slightingly of teaching, of educational institutions, and of members of the profession, or concealment of the fact that one is a teacher. Stated positively, the teacher should protect the honor and dignity of the profession in the presence of laymen.

7. A teacher should encourage the fit to enter the profession.

8. A teacher should not use the profession merely as a stepping stone to other vocations. Chambers makes one exception to this rule, namely, motherhood. "Moreover," he continues, "when the obligations of motherhood have been satisfied, the mother who was previously trained as a teacher should be welcomed into active service in the profession. She has probably been much improved in her qualifications as a teacher by her experience as a mother."[1]

9. A teacher should not "talk shop" in the presence of strangers or of laymen. There are two implications: that the teacher has a right to separate professional from social or other affairs; and that discussion of professional matters with the uninitiated tends to cheapen the profession.

10. A teacher should defend, financially and legally if necessary, another teacher who is unjustly attacked or who is being made to suffer for services authorized by an association of teachers. This rule includes the prevention of political manipulation in matters of appointment, promotion, and salary advance.

IN RELATION TO THE PUBLIC—

1. A teacher should conform to the standards of the community in matters of personal conduct. This implies a willingness on the part of the teacher to forego personal prejudices rather than invite unnecessary criticism.

2. A teacher should participate in community affairs. This includes the performance of the reasonable obligations of citizenship. It is implied that teachers, by reason of their exceptional qualifications and positions, owe an unusual obligation to the community. The New Hampshire Code specifies that teachers should regard themselves as guardians and promoters of the physical, moral, social, and spiritual welfare of the

[1] *Op. cit.*, p. 121.

community. Some writers warn against the expenditure of too much time and energy in community affairs to the detriment of school work.

3. A teacher should place the public good before personal gain. Stated as a rule this is merely an application of the third principle. Specific instances of application do not appear in the codes or articles.

4. A teacher should refrain from undue political ambitions, such as the use of a professional organization for political control.

5. A teacher should resent unwarranted interference in professional matters by a layman. It is stated that the teacher should frown upon the expression of opinion in regard to school matters by those who are uninformed.

IN RELATION TO THOSE COMMERCIALLY INTERESTED—

1. A teacher should not accept favors from commercial men. Favors mentioned are free books and gifts from supply houses presented when receiving an order for supplies. The teacher is not an object of charity and should not be obligated for future orders.

2. A teacher should not act as agent or receive commission, royalty or anything else of value for books or supplies which he officially helps to select. This unique provision occurs only in the Pennsylvania Code. It occurs in the state laws of nine states one of which (Minnesota) makes an exception of royalties on books written by the teacher.* The writing of the best texts by the best school men is to be encouraged. The author of a text in a particular field, however, is probably not an unbiased judge in the selection of textbooks in that field. In addition to waiving royalty he might well refer the selection to a competent and unbiased judge.

A few rules and suggestions occurred in only one code or article. On the hypothesis that rules have been formulated in connection with practical cases these are worthy of consideration. They are: a teacher should not accept expensive gifts from pupils; should not interfere with the administration of a successful competitor for position; should not be over-dogmatic; should consider himself the permanent incumbent of the position held; should not write testimonials for canvassers or salesmen; should not leave the profession in time of need; and should not exercise extravagance in the expenditure of district funds.

Conclusions

A fairly definite group of principles in regard to professional conduct of teachers is recognized in the codes of ethics adopted

*The states are Arizona, Florida, Iowa, Minnesota, New Jersey, Ohio, Pennsylvania, Utah, and Vermont. *See* School Codes.

by the various associations of teachers and in the opinions of writers on this subject. These compare favorably with the principles of ethics underlying the codes of other professions.

There is a considerable agreement among the codes and opinions as to rules for conduct applicable to the important problems of professional conduct. No set of rules can be considered adequate for all ethical problems. In the absence of a specific rule for a point in question the fundamental principles can be invoked. In the final analysis the teacher's own personal honor and refined sense of justice should determine conduct. There are no points of disagreement among the codes adopted which are irreconcilable by fair-minded and upright teachers.

Formal adoption of similar codes of ethics by associations of teachers should clarify the ideals of the profession both for its members and the public. Such codes would undoubtedly help beginning teachers and should be in the curriculum of teacher-training institutions.

The writer has not attempted to formulate an ideal code of ethics for teachers. Nevertheless the provisions of existing codes and the consensus of expressed opinion here summarized should be of value to teachers' associations or to committees in considering and formulating such codes.

Bibliography

Aspinwall, W. B. "Code of Ethics for Teachers," *School and Society*, 17: 640-44, June 8, 1923.

Bagley, W. C. *Classroom Management*. New York, Macmillan Company, 1922. pp. 250-60; 267-73.

Bixby, Herbert D. *The Ethics of Teaching Service*. Cleveland, Ohio, Division of Publications, Board of Education. 1921. (Monograph No. 27).

Chambers, G. G. "Codes of Ethics for the Teaching Profession," *Annals of the American Society of Political and Social Sciences*, vol. ci i, pp. 121-26, no. 190, May, 1922.

Cody, F. "Professional Consciousness," *School and Society*, 18:384, September 29, 1923.

Cook, R. E. "Ethics of the Teaching Profession," *American School Board Journal*, vol. 58, no. 3, p. 34, March, 1919.

Downes, F. E. "Teachers Crises," *American School Board Journal*, vol. 60, no. 1, 40-42, January, 1920.

Ettinger, W. L. "Ethical Standards of the Teacher," *School and Society*, 17:568-72, May 26, 1923.

Horne, H. H. "Teacher's Code of Honor," *School and Society*, 19:477-82, April 26, 1924.

Lee, Edwin A. "The Need for a Professional Spirit," *School and Society*, 15:659-66, June 17, 1922.

Maxwell, W. H. "The American Teacher," *Educational Review*, 25:146-66, February, 1903.

Mudge, E. L. "Professional Ethics for Teachers," *School and Society*, 12: 601-04, December 18, 1920.

Patterson, Herbert. "Common Sense and the Teachers' Contracts," *School and Society*, 10:553-56, November 8, 1919.

Robbins, C. L. *The School as a Social Institution*. Boston, Allyn and Bacon, 1918. pp. 449-51.

Sears, J. B. *Classroom Organization and Control*. New York, Houghton Mifflin Company, 1918. pp. 275-91.

Skinner, J. A. "Professional Standards for Classroom Teachers," *National Educational Association Proceedings*, 1922. pp. 198-201. Also in *Journal of the National Education Association*, 12:25-26, January, 1923.

Smith, W. R. "Professional Status of Teaching," *Educational Review*, 63:35-49, January, 1922.

Suzzallo, Henry. "The Reorganization of the Teaching Profession," *National Education Association Proceedings*, 1913. pp. 362-75.

Suzzallo, Henry. "Profession of Teaching," *Cyclopedia of Education*, Paul Monroe, editor. New York, Macmillan Company, 1911. vol. 5, p. 586.

Wilkinson, Marguerite. "What is the Matter with the Teacher's Job?" *Independent*, vols. 100-101, December 13, 20, 27, 1919; January 3, 10, 17, 1920.

PUBLISHED CODES

"Code of Ethics Adopted by the Massachusetts Teachers' Federation," *School and Society*, 5:132-33, February 3, 1917.

"Code of Ethics of the Alabama Educational Association," *Journal of Education*, 84:515-16, November 23, 1916.

"Code of Ethics Formally Adopted by a Unanimous Vote of the Cincinnati Teachers' Association in June, 1922." *American Physical Education Review*, 28:138-39, March, 1922. Also reported by C. M. Howe, "Teachers Ethics as Viewed by Teachers," *School and Society*, 16: 546-49, November 11, 1922.

"Code of Ethics for the Teaching Profession," *School and Society*, 9:599-601, May 17, 1919. Also reported by G. G. Chambers in the *Journal of the National Education Association*, 11:401-403, December, 1922; and in the *Annals of the American Academy of Political and Social Sciences*, vol. ci, no. 190, 281-83, May, 1922. (Pennsylvania)

"Code of Professional Ethics for Utah Teachers," *Utah Educational Review*, 17:1, November, 1923.

"A Code for Teachers," *Journal of Education*, 83:383-84, April 6, 1916. (Levana Club of Worcester, Massachusetts)

"Ethics for Teachers," *Journal of the National Education Association*, 11: 148, April, 1922. (Batavia, Illinois)

"Ethics for Teachers," *Journal of the National Education Association*, 11: 219-20, June, 1922. (New York)

"Ethics for Teachers," *Journal of the National Education Association*, 11: 364, November, 1922. (Virginia)

"Ethics for Teachers, Report of a Commission of the Michigan State Teachers' Association," *Journal of the National Education Association*, 10: 140, October, 1921. Also in *School and Society*, 13:298-99, March 5, 1918.

"Ethics for Teachers," *Journal of the National Education Association*, 12: 40, January, 1923. (Iowa)

"Ethics for Teachers," *Journal of the National Education Association*, 12: 40, January, 1923. (Mississippi)

Professional Code of Ethics. Committee Report of the California Council of Education. December 15, 1923.

"Professional Ethics: Adopted by the New Hampshire State Teachers' Association," *Journal of Education*, 82:573, December 9, 1915.

NOTES ON THE CURRICULUM IN COLONIAL AMERICA

ROBERT FRANCIS SEYBOLT
University of Illinois

SPANISH

By the opening of the eighteenth century, New York City had achieved a position of prominence among our colonial seaports. It may be recalled that a considerable portion of her maritime commerce was with Spain and the Spanish ports of the West Indies and South America. An interesting incident of this trade relationship was that the merchants of the city and others in various parts of the colony early learned the value of Spanish coin. In fact, it was often preferred to that of England. The successful merchant learned, also, that it was necessary to acquire the language of those with whom he exchanged commodities, or, at least, to have access to individuals who were qualified to translate his correspondence and other business documents. To meet this demand, the language masters of the city gave instruction in Spanish and offered their services as translators.

Spanish was taught in New York City as early as 1735. In the *New York Gazette*, for July 14-21, of that year, the following unsigned advertisement appeared:

> This is to give Notice that over against the Sign of the black Horse in Smith-street, near the old Dutch Church, is carefully taught the French and Spanish Languages, after the best Method that is now practiced in Great Britain which for the encouragement of those who intend to learn the same is taught for 20*s* per Quarter.

The name of the master is unknown, and later publication of this notice does not reveal his identity.[1] In 1747, Augustus Vaughan opened "A School . . . . in New-street, near the Corner of Beaver-street, where English, Latin, Spanish, and Italian are correctly and expeditiously taught."[2] Two years later, John

[1] *New York Gazette*, July 21-28, July 28, August 4, August 4-11, 1735.
[2] *New York Gazette*, revived in the *Weekly Post Boy*, October 26, 1747.

Clarke, who kept school "at the New-York Ferry upon Nassau Island," announced that he "translated and taught" French and Spanish.[3]

Perhaps the best-known teacher of Spanish in New York City, at the middle of the century, was Garrat Noel, whose school was located "at the House of Mrs. Easthams, the lower End of Broad-Street, near the Long-Bridge."[4] Noel published, in 1751, "a true Translation of the Spanish Bulls, or a Form of the Pope's Absolution;"[5] and also a textbook, which he described as "A Short Introduction to the Spanish Language, to which is added a Vocabulary of Familiar Words for the more speedy Improvement of the Learner; with a Preface showing the Usefulness of this Language particularly in these Parts."[6]

Two other language masters, of later date, are worthy of inclusion in this group: Francis Humbert de la Roche and Anthony Fiva. De la Roche, "having taught the French Language in this City for a few Years," announced, in 1772, that he would "also teach to read Latin and Spanish."[7] In the following year, Fiva "gave notice" that he "continues to teach grammatically, at his house in Dutch Church Street, opposite Captain Berton's, the French, Spanish, and Italian Languages in their greatest purity . . . . Mr. Fiva has had an academical education, and resided many years in Paris and Madrid."[8] An announcement of 1774 "informs his friends, the encouragers of literature, and the public in general, that he is removed opposite the sugar-house, in new Dutch Church-street, where he continues as before. . . . He enables his pupils, in a short time, to carry on an epistolary correspondence, so useful to young persons in business."[9]

[3] *New York Gazette*, December 4, 11, 18, 1749; January 1, 1750.
[4] *New York Gazette*, January 21, 28, 1751.
[5] *New York Gazette*, January 14, 1751.
[6] *New York Gazette*, September 2, 9, 16, 23, 1751.
[7] *New York Gazette and Weekly Mercury*, March 2, 1772.
[8] Rivington's *New York Gazetteer*, or *Connecticut, New Jersey, Hudson's River, and Quebec Weekly Advertiser*, July 22, August 12, December 9, 16, 1773.
[9] Rivington's *New York Gazetteer*, etc., May 19, 26, 1774; also in issue dated December 22, 1774: "he still continues teaching the above languages . . . . after the manner of academies, universities, and colleges of the learned world."

Occasionally, the masters were employed by merchants to take charge of their Spanish correspondence and other papers. John Clarke offered to give "sufficient Security . . . . to keep all Writings Secret." Garrat Noel announced that he "translates Accompts, and other Papers, in the Spanish and Portuguese Languages"; and Anthony Fiva, that he "translates from any of the said languages (French, Italian, and Spanish) into the English, or either of the two others, with accuracy, dispatch, and secrecy, for attorneys, merchants, etc." Such announcements supplement, in a measure, other evidences of the importance of the language to those engaged in the Spanish trade.

These schools served two classes of students during the period considered. To some, they offered an opportunity of studying the language for purely cultural purposes. The cultivated New Yorker of that day was interested not only in the stirring events that had characterized the history of Spain in the sixteenth century, but he read her literature as well. For others, the language masters provided a necessary part of the commercial training of the eighteenth century.

Italian

It can hardly be said that New York City had an Italian population during the seventeenth century. By the middle of the eighteenth century, however, there was a small, but respectable and substantial group of Italian citizens within the city, and they were not without intellectual contacts among those of English birth and education. The cultivated New Yorker of that day was acquainted with the language and literary traditions of Italy. He read, in the original, the masterpieces of "that polite tongue."

The records indicate that instruction in Italian was offered in New York by the middle of the century. In 1747, "A School" was "open'd in New-street, near the Corner of Beaver-street, where English, Latin, French, Spanish, and Italian are correctly and expeditiously taught by Augustus Vaughan."[10]

[10] *New York Gazette*, October 20, 1747.

An announcement by Anthony Fiva, in 1773, may be of interest:

> Anthony Fiva
>
> Continues to teach grammatically, at his house in Dutch Church-street, opposite Captain Berton's, the French, Spanish, and Italian Languages, in their greatest purity, on moderate terms: He also attends ladies and gentlemen in their own houses at any convenient hour; likewise translates from any one of said languages into the English, or either of the two others, with accuracy, dispatch, and secrecy for attorneys, merchants, etc., and as Mr. Fiva has had an academical education, and resided many years in Paris and Madrid, he is therefore able to resolve any question that might puzzle his scholars and entirely ground them both in the true accent of these polite languages, and all the rules of the syntax.
>
> Mr. Fiva returns his most humble thanks to the Ladies and Gentlemen of this City, for the many favours he daily receives from them. His evening lessons from 6 to 8, Saturday excepted.[11]

A year later, Fiva "informs his friends, the encouragers of literature, and the public in general, that he is removed opposite the sugar-house in new Dutch Church-street. . . . He enables his pupils in a short time to carry on an epistolary correspondence."[12]

In "A NEW ACADEMY for teaching MUSIC; DANCING and the ITALIAN and FRENCH LANGUAGES," established in 1774, Nicholas Biferi was "master of music"; Pietro Sodi, "dancing master"; and Joseph Cozani taught "the French and Italian languages."[13] Mrs. Cozani, at the same time, conducted a "FRENCH BOARDING SCHOOL," in Wall Street, "where are taught the English, French, and Italian languages grammatically; also to write and translate one language into another."[14]

Such schools aided in the process of bringing together the diverse racial elements of the city. They played a small, but sig-

[11] Rivington's *New York Gazetteer*, etc., July 22, August 12, December 9, 16, 1773.

[12] Rivington's *New York Gazetteer*, etc., May 19, 26, 1774, also in the issue dated December 22, 1774: "at his house in Crown Street opposite the sugar-house."

[13] Rivington's *New York Gazetteer*, etc., May 5, June 16, 1774.

[14] Rivington's *New York Gazetteer*, etc., July 21, 1774; April 20, 27, 1775.

nificant, part in the fusion that was necessary to the evolution of the American citizen of the nineteenth century.

Astronomy

The impression one gains from most comments on the curriculum of the colonial period is that astronomy was taught only in the colleges.[15] We know that it had a place in the curricula of some of the academies, but our texts inform us that these institutions did not appear until after the establishment of the Philadelphia Academy in 1751, and that they did not become popular until the last quarter of the eighteenth century.[16] As a matter of fact, astronomy was a popular subject of instruction in colonial America. School announcements at hand indicate that it was offered in some eighty-six different schools during the years 1709-69.

The earliest press announcement of the teaching of astronomy appears in the *Boston News Letter*, March 14-21, 1709:

> Opposite to the Mitre Tavern in Fish-street near to Scarlets Wharff, Boston, are Taught Writing, Arithmetick in all its parts; And also Geometry, Trigonometry, Plain and Spherical, Surveying, Dialling, Gauging, Navigation, Astronomy; The Projection of the Sphaere, and the use of Mathematical Instruments: By Owen Harris.
>
> Who teaches at as easie Rates, and as speedy as may be.

John Green, also of Boston, advertised astronomy in the same year.[17]

John Leach and Charles Shimmin of the same city likewise taught astronomy during the colonial period.[18]

[15] Meriwether, C. *Our Colonial Curriculum*. Washington, D. C., Central Publishing Company, 1907, 177-79. "Far more than algebra was astronomy a land of magic and mystery to our colonial ancestors . . . . Those boundless spaces above and around were the haunts of ignorance, superstition, credulity. Here the imagination had full play for its wildest absurdities and most intricate perplexities . . . . From such mists and fogbanks with only small lights of real knowledge, there could not be very helpful teaching in the schools. But it was in the colleges from the beginning. Being yoked with religion so intimately it went wherever that branch was taught." It is evident that Meriwether gave his "imagination full play."

[16] Astronomy appears in the curriculum announced for the opening of the Philadelphia Academy, January 7, 1751. (*Pennsylvania Gazette*, December 18, 1750)

[17] *Boston News Letter*, March 21-28, 1709.

[18] *Independent Advertiser* (Boston), April 17, 24; May 1, 1749. John Leach. *Essex Gazette* (Salem, Mass.), July 14-21, 21-28; August 4, 1772. Charles Shimmin.

It was offered in Philadelphia, as early as 1733, by Andrew Lamb, well-known as a teacher of navigation.[19] In the following year, the subject appears among the courses announced by Theophilus Grew, who later became first professor of mathematics at the College and Academy of Philadelphia.[20] Thomas Godfrey, member of Benjamin Franklin's "Junto" and of the American Philosophical Society, was teaching astronomy in 1740.[21] Charles Fortesque was teaching it in 1743.[22]

New York had two teachers of astronomy in 1747—Joseph Blanchard and George Bingham.[23] During the next five years at least three others were teaching the subject.[24]

In the colleges, astronomy was considered a pure science. This viewpoint was rarely taken in institutions of subcollegiate grade. Isaac Greenwood (Harvard, 1721), advertised in the *Boston News Letter*, June 29–July 6, 1727, "to such as are already instructed in the Mathematical Sciences, the Principles of Sir Isaac Newton, and the Modern discoveries, in Astronomy and Philosophy, will be explained and demonstrated in a concise and easy manner." In the same year Greenwood became the first Professor of Mathematics at Harvard. After his dismissal in 1738 he reopened his private school.[25] It is very probable that Greenwood emphasized the cultural as well as the practical values of astronomy. The same may no doubt be said of Nathan Price, of Boston, who, after his dismissal from Harvard in 1742, where he had been tutor in mathematics, advertised to teach astronomy.[26] Joseph Kent (Harvard, 1731), also of Boston, in-

[19] *American Weekly Mercury*, September 6-13 and many issues in 1733 and 1734.

[20] *American Weekly Mercury*, October 3-10, 1734 and several issues in that and the following year. Also, *Pennsylvania Gazette*, October 14, 1742. Several issues in 1742, 1743, and 1744.

[21] *Pennsylvania Gazette*, October 30; November 6, 20, 27, 1740.

[22] *Pennsylvania Gazette*, November 24; December 1, 6, 15, 20, 1743.

[23] *New York Evening Post*, August 3, 1747.

[24] *New York Gazette*, etc., May 13, etc., 1751 and 1752 (John Nathan Hutchins); March 16, etc., 1752 (Thomas Allen); June 4, etc., 1753 (John Lewis).

[25] *Boston Gazette*, March 26; April 2, 2-9, 1739.

[26] *Boston News Letter*, March 3, 10, 1743.

cluded "Calculation of Eclipses" in the the curriculum of his school.[27]

In most private schools of the eighteenth century, astronomy was one of the "practical branches" and was taught with reference to its use in navigation.

[27] *Boston News Letter*, October 9-16, 1735.

(*Continued in December*)

THE CORRELATION BETWEEN COLLEGE LECTURE NOTES AND QUIZ PAPERS

C. C. CRAWFORD
University of Idaho

The practice of taking notes during the lecture period is widespread, in fact, almost universal, among students in American colleges. The attitude of college instructors toward note-taking on the part of their students varies considerably. Some instructors require notes, and even collect notebooks and grade them. Some teach their students how to take notes at the beginning of the course, while others discourage note-taking, and still others forbid it, giving as a reason for doing so their desire that the students get their ideas, rather than their words. There is in many quarters a conviction that undivided attention to the lecture as it is delivered is superior to writing notes and later studying them.

Obviously there is need of some investigation of the relation between note-taking during lectures and the results secured at the time of quizzes which test the results of the lecture periods. This article is a brief report of a series of studies made by the writer for the purpose of shedding light on some of the questions suggested above.

The main purpose of this study has been to determine the effect produced upon the quiz grades of college students by note-taking during lectures and by the later study or review of those notes. This study does not undertake to isolate the effects of taking from reviewing notes, nor does it attempt to determine the results of a period of training in relying on memory or on notes. Furthermore, it does not take account of many important qualitative differences between notes. It is primarily quantitative, since the unit of measurement is the number of points or ideas recorded rather than the organization, selection, importance, conciseness, and neatness of the notes as a whole.

The principal steps in the investigation were: (1) delivering lectures on which students took notes according to their normal habits; (2) giving quizzes on these lectures after a few days or weeks under normal classroom conditions customary in the particular courses involved; (3) collecting from the students the notes which they took on the lectures and scoring them as to the points or ideas included; (4) scoring the quiz papers with respect to the same list of points as were scored in the notes; (5) securing other available measures of the students, such as intelligence scores, grades on other quizzes, term papers, and final examinations; (6) comparing the scores on the notes with the scores on the other tests by means of such statistical devices as correlation, partial correlation, and association.

The studies included seven class groups, a total of 211 students. The students ranged from Freshmen to Graduates, and represented two different institutions. Lectures were given by the writer to five of the classes and by two professors in the University of Chicago to the other two classes. The lectures were all on different parts of the general field of education and psychology. In most cases only one lecture was included in the study for each class, but in two of the classes there was a series of lectures instead of a single one. The lectures were delivered from outlines or lists of points prepared by the lecturers, so each case had a definite record of the substance of the lecture to use as a scoring standard. The time interval between lecture and quiz varied from two to thirty-five days, with a median period of nineteen days between.

The quizzes used in Classes I-V were of the traditional essay type and practically amounted to asking the student to tell what he could recall about the subjects covered in the lectures. In Class VI the quiz was in the form of a completion test consisting of one statement for each of the major points in the lecture, while in Class VII the quiz was more in the nature of thought questions based on the lecture. Classes I-VI were notified of the quizzes beforehand and reviewed for them, but Class VII was not notified and made no special preparation.

The standard for scoring notes was the same as that for scoring the quiz paper in each case. This consisted of the list of points covered in the lecture, or in case of a series of lectures to one class it consisted of those points which were asked for in the quiz. The notes and quiz papers were scored independently so that when scoring a person's notes the grader had no knowledge of the score on his quiz paper. This was accomplished by the use of a system of code numbers. Each point in the scoring standard was scored individually by giving it a rating of either "right," "vague," "omitted," or "wrong." The status of each point was recorded on cross-section paper in such a way that the scores on each student's notes and quiz paper were in parallel columns. This made possible not only a comparison of total scores but also point-to-point comparisons of notes and quiz papers in great detail.

An additional method of scoring was employed for the quiz papers of Class VII. This was simply to read the papers over and estimate the worth of each answer as a whole without counting the points in detail.

Intelligence-test scores were available for all students in Class VII, for 10 in Class II, and for 7 in Class III. For Class VII we have the grades on six weekly quizzes, a term paper, and two final examinations of one hour each.

From the method of scoring and tabulating scores described above, we had several possible totals for correlation purposes. We could correlate the total number of points "right" in the notes with the corresponding score for the quiz paper; we could use the total number of points "vague" in each, or the total present in either right or vague form. The various coefficients of correlation which have most importance are set forth in Table I, together with their respective standard errors.

The most striking thing shown in Table I is the positive correlation between the total points *Right in notes and quiz papers*, ranging from .36 to .66 with a median of .50. The correlation of *Vague in notes with vague in quiz* is not so pronounced, but positive in all but one class. For the total *Present in notes and*

quiz (right plus vague) the correlation is positive in all classes but varies considerably in amount. The total right in notes correlates with the total present in the quiz to a greater degree in every class than does the total vague in the notes. In fact, the latter yields a negative correlation in all but two classes. This contrast indicates that the full, clear, and definite notes, such as

TABLE I. CORRELATION BETWEEN NOTES AND QUIZ PAPERS WITH STANDARD ERRORS

Scores Correlated	Coefficients and Standard Errors by Classes							
	I	II	III	IV	V	VI	VII	Median
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Right in notes with right in quiz	.47 (.14)	.50 (.14)	.57 (.16)	.66 (.10)	.66 (.12)	.38 (.16)	.36 (.12)	.50
Vague in notes with vague in quiz	−.13 (.17)	.11 (.19)	.32 (.21)	.36 (.15)	.26 (.19)	.23 (.18)	.18 (.14)	.23
Present in notes with present in quiz	.07 (.18)	.64 (.11)	.11 (.23)	.63 (.10)	.42 (.17)	.06 (.19)	.30 (.14)	.30
Right in notes with present in quiz	.35 (.16)	.52 (.14)	.38 (.20)	.55 (.12)	.47 (.16)	.31 (.17)	.24 (.13)	.38
Vague in notes with present in quiz	−.30 (.16)	.24 (.19)	−.65 (.13)	−.05 (.17)	−.01 (.21)	−.44 (.15)	.03 (.14)	−.05
Right in notes with vague in notes	−.55 (.12)	−.14 (.19)	−.93 (.03)	−.55 (.12)	−.06 (.21)	−.62 (.12)	−.60 (.05)	−.55

were scored as right, are much more closely related to quiz success than the brief, sketchy, or indefinite notes which were scored as vague.

The fact that in every class there is a negative correlation between right and vague notes is to be expected, since the more points a student records in one form the fewer there are left to be recorded in the other form.

It has been mentioned that grades were available for the entire forty-nine students in Class VII on six short weekly tests, a term paper, and two final examinations of one hour each. Using the total number of points right in the notes we have found

that the notes on the one lecture scored for Class VII correlated with the already-mentioned grades to the amounts of .04, .42, .25, .24, .23, .39, .33, .35, and .50 respectively. The median of these is .33. It appears from these results that the scores on one's notes are positively correlated with success in the course as a whole as well as in the quiz on the specific lecture from which notes were collected. This fact implies either that good notes indicate high student ability in general, or else that the sampling of notes secured on the one lecture is typical of the notes taken on the other lectures in the course. The latter is probably true, the writer believes, because his inspection of a large number of notebooks reveals a constant tendency to take the same type of notes day after day throughout the course.

By means of partial correlation, it is possible to determine the relation of the total right notes to the quiz score when the number of vague notes is held constant, and vice versa. This isolates the effects of these two variables, and, therefore, indicates the relative values of the two kinds of notes. The kind of notes which yields the higher degree of correlation with quiz grades when the other kind of notes is held constant is obviously the kind to be desired. Table II shows the results of such calculations. The right notes yield higher partial correlation in every class than the vague notes when the other kind is held constant. No importance should be attached to the negative coefficients for Class III, for they are produced by statistical peculiarities of the data which cannot be entered into here. The net effect of Table II is that right notes are distinctly desirable, but that vague notes are sometimes slightly undesirable, and that even when of actual positive value they are less valuable than the better kind of notes which they displace.

We shall next examine the part played by intelligence differences in producing the correlations we have found between notes and quiz papers. The reader has already probably begun to question whether the bright student may not also be the successful note-taker and the dull student the poor note-taker. That such a situation does not exist in any important degree is shown by the findings to be given later.

By means of partial correlation it is possible to determine the correlation between notes and quiz papers when the factor of intelligence is held constant. We have intelligence scores for ten, seven, and forty-nine students respectively in Classes II, III, and VII. Correlations based on ten or seven cases are of course practically worthless, but they are included simply to suggest what might be looked for in larger groups, and also because they are in essential harmony with the results of Class VII in which forty-nine students are involved.

TABLE II. PARTIAL CORRELATION COEFFICIENTS SHOWING RELATIVE EFFECTS OF RIGHT AND VAGUE NOTES ON QUIZ GRADES

Class	Partial Correlation Coefficient	
	Right Notes with Total Present in Quiz, Vague Constant	Vague Notes with Total Present in Quiz, Right Constant
(1)	(2)	(3)
I	.23	—.14
II	.58	.37
III	—.77	—.84
IV	.63	.36
V	.47	.02
VI	.05	—.33
VII	.27	.06
Median	.27	.02

Table III shows in parallel rows the simple correlations between notes and quiz papers and the partial correlations secured when the intelligence factor is held constant. The significant fact shown in the table is that there is very little change when intelligence is held constant.

The foregoing results have all been in terms of correlation between total scores of various kinds. We shall now note the results of a more detailed point-to-point comparison of notes and quiz papers.

The method of tabulating scores was such that we can make a direct comparison of the status of any given point in the notes

of any student with the status of the same point in the same student's quiz paper. For example, we can determine the number of points which are present in both the notes and the quiz paper, the number omitted from each, or the number present in

TABLE III. CORRELATION COEFFICIENT SHOWING THE INFLUENCE OF THE INTELLIGENCE FACTOR

Kind of Correlation	Coefficients by Classes		
	II (10 cases)	III (7 cases)	VII (49 cases)
(1)	(2)	(3)	(4)
Simple correlation between notes and quiz with standard errors	.51 (.23)	.53 (.27)	.20[a] (.13)
Partial correlation, intelligence held constant	.54	.52	.24

[a] Scores correlated are total points right, except in Class VII, where the general quiz grade is used.

TABLE IV. COMPARISON OF THE STATUS OF SPECIFIC POINTS IN NOTES AND QUIZ PAPERS

Number of Points in Quiz Which Were:	Number of Points in Notes Which Were				
	Wrong	Omitted	Vague	Right	Total
(1)	(2)	(3)	(4)	(5)	(6)
Right	2	165	200	625	992
Vague	1	150	284	168	603
Omitted	28	1,868	655	559	3,110
Wrong	7	29	5	5	46
Total	38	2,212	1,144	1,357	4,751

the notes but omitted from the quiz. Thus we can prepare a contingency table showing the number of cases of each combination. Table IV presents the results of Classes I-VI by means of such a table. The quiz in Class VII was such that it was impossible to treat its results by this method.

By consolidating the scores of "right" and "vague" and calling the total "present" and by consolidating those of "wrong"

and "omitted" and calling the total "absent" we arrive at the two-by-two classification shown in Table V. From this table it is seen that in the entire six classes there are only 318 points which were recalled and written in the quiz paper in a form scored as either right or vague which had been omitted from the notes.

In view of the large number of points involved, this extremely small number of points which were recalled without the aid of notes indicates that the quiz results of these students were very

TABLE V. COMPARISON OF THE STATUS OF SPECIFIC POINTS IN NOTES AND QUIZ PAPERS
(A condensation of Table IV)

	Number of Points Wrong or Omitted in Notes	Number of Points Right or Vague in Notes
(1)	(2)	(3)
Number of points right or vague in quiz papers	318	1,277
Number of points wrong or omitted in quiz papers	1,932	1,224

definitely limited to the points upon which they took notes. Thus, only 318 points out of a total of 2,250 which were omitted from the notes were recalled at the time of the quiz, as compared with 1,277 out of a total of 2,501 which were present in the notes.

The same fact may be stated in another way. There were 1,277 cases which were present in both notes and quiz papers, and 1,932 cases which were absent in both, or a total of 3,209 cases which had the same status in the quiz as in the notes. There were 1,542 cases which had a different status in the quiz from that in the notes, and 1,224 of these were points on which notes were taken but which were not recalled at the time of the quiz. It is apparent, therefore, that taking notes on a point does not guarantee its being recalled at the time of the quiz, but that failure to take note of it very greatly decreases its chances of being recalled.

Summary and Conclusions

1. There is a significant positive correlation between the number of points recorded in the lecture notes and the number recalled at the time of the quiz.

2. The notes which are full, clear, and definite are more effective than those which are brief, sketchy, or vague. That is, when writing a note on a point it is well to write it down in unmistakable terms which will convey the idea fully when reviewing later.

3. Intelligence as measured by a given test is not an important third factor in determining the correlations found to exist between notes and quiz papers.

4. There is not only a correspondence between the total number of points in the notes and the total in the quiz papers, but also the points which are found in the quiz papers are the same points, with very few exceptions, which were recorded in the notes; and only a very small percent of the points which the note-taker omits from his notes are recalled and written in the quiz paper.

The reader should bear in mind that the results of these studies do not prove with certainty that the taking and reviewing on the notes caused the quiz results. It is possible that some third factor may be responsible for the correlations which have been found to exist. But intelligence is clearly not such a third factor, and if there were such a third factor beside intelligence it would have to be of a kind that could produce the point-to-point correspondence as well as the general correlation of totals. It seems, therefore, highly probable that the quiz results are directly influenced by the note-taking practices of the students, and that the prevailing practice of taking notes on lectures and studying them before the quiz makes for better grades on the quiz. Further work should be done along certain lines to supplement and extend this investigation. First, if note-taking is beneficial, as we have found it to be, there is great need of an analysis of note-taking practice and procedure in greater detail to teach students how to get the best possible results from

their efforts. This is very closely bound up with the growing tendency to give definite training to students regarding methods of study. The writer is attempting to do this sort of thing in connection with a course in Methods of Study which he is giving in the University of Idaho.

Second, there is need of investigation to determine the possibility of developing power to remember lectures without the use of notes. Blind students and the students of certain foreign countries are sometimes cited as illustrations of what is possible in this line. It would be well to determine the extent to which this power could and should be developed in American students.

Third, there is need of further study of note-taking under experimental conditions which permit a more thorough analysis of the different factors involved. For example, the results in this article do not allow any adequate comparison of the results of taking notes and reviewing notes which had been taken previously. The writer has conducted experiments in which this and other important aspects of the problem have been analyzed. The results of these experiments are reported in a separate article.

A FLEXIBLE PLAN OF SUPERVISED STUDY

H. G. Lull
Kansas State Teachers College, Emporia

All individual activities of the members of a class, which are individually directed by the teacher in charge, we understand to be supervised study. All group activities of the class, whether of the class as a whole or of two or more groups of the class, we understand to be recitation activity. The teacher is supervising study only when she is addressing herself to the individual pupil and not when she is working with the class as a whole, or with any group of the class. Recitation is the social activity of the class, and study is the individual activity. Both kinds of activities are essential.

The teacher should stimulate the pupils to do good work in the study activity, but she should not do the work for them. Before the pupils recite again she should know accurately what each one has accomplished in the study, in order that the recitation may be something other than quizzing for information, and in order that the transition from study to recitation may take place at the right time.

In supervised study the teacher should provide the pupils with facilities, materials, and sources of information with which to work. For example, she should stimulate them to think accurately in constructing tentative plans for their work by asking individual pupils such questions as, "What bearing has your fourth step upon the question?" or "What is the relation of the fifth point to the sixth?" When a pupil has finished his tentative outline she should stimulate him to gather carefully the information required by asking such questions as the following: "With what facts do you support this point?" "From what facts do you support this conclusion?" "Where would you be likely to find reliable information on this point?"

Supervised study is not a study-hall activity. Pupils will, of course, go to the study hall or to the library to study during the

periods in which they are not occupied in recitation or supervised study. Each teacher supervises the study of her own classes. When supervised study is correctly understood it will be found to demand preparation equal to that required for successful teaching in the recitation. To succeed, the teacher must be constantly alert and active. She should stimulate successful study activity by the pupils rather than act as an authority or as a general source of information.

Since the relationship between the recitation and study is a functional relationship, the amount of time given to these two

TABLE I. SCIENCE REPORT FOR WEEK ENDING DECEMBER 12 SHOWING NUMBER OF MINUTES DEVOTED RESPECTIVELY TO GROUP AND STUDY ACTIVITIES

	Monday		Tuesday		Wednesday		Thursday		Friday		Total	
	Group	Study	Group	Study	Group	Study	Group	Study	Group	Study	Group	Study
VIII-A (Science)	40	0	40	0	20	20	0	40	0	40	100	100
IX (Biology)	20	20	40	0	40	40	0	40	20	60	120	160
VIII-B (Science)	0	40	40	0	40	0	40	0	40	0	160	40
Total											380	300
Percent of time											56	44

types of activities cannot be arbitrarily determined. Frequently two, three, three and a fraction, or four consecutive periods are devoted profitably to the recitation activity before study begins; and the reverse is also true. The change from recitation to study, or the reverse, may take place at any time during the period at the discretion of the teacher.

Believing that a flexible division of time between recitation and study is better than an arbitrary division, we introduced the former plan in our junior high school and intermediate grades several years ago. From time to time, our supervising teachers were asked to keep a daily record of the distribution of time between recitation and supervised study.

Table I shows a weekly summary of these daily reports in junior high-school science. Other subjects were summarized for each week in the same way. The reader will note that 44 percent of the time in the week ending December 12 was spent in supervised study. This figure will be noted in the proper column of Table II.

The percents in Table II represent the weekly summaries of the relative amounts of time devoted to supervised study over a period of fifteen weeks. For example, 47 percent of the total time devoted to English in grades IV to VI during the week ending October 10 was used in supervised study. The other percents in the table are to be interpreted in a similar manner. Subjects in which individual study does not ordinarily occur are not reported. This table shows the average percent of each week's class periods devoted to supervised study. The record for the intermediate grades is shown in the upper part of the table. In these grades four teachers out of seven gave less than 50 percent of the time to supervised study. As would be expected, relatively more time was devoted to supervised study in the junior high school than in the intermediate grades. Eight out of eleven teachers of the junior high school devoted to it more than 50 percent of the total time allotted to their subjects. The least amount of time given to supervised study was in community civics; the greatest amount was given to one of the classes in home economics.

We have made no attempt to determine how much of the total time devoted to a certain subject should be given to supervised study. On the whole, it appears that in our work we are devoting a little more time to supervised study than other schools which make an arbitrary division between recitation and study time. Our experience in supervised study seems to show that, as teachers become more adept in the technique of supervised study, the time devoted to it gradually increases.

Various speculations may be made regarding the nature of the subject in relation to the time consumed in supervised study. Perhaps, the 29 percent in community civics is due to the nature

TABLE II. PERCENT OF SUPERVISED STUDY IN THE INTERMEDIATE AND JUNIOR HIGH-SCHOOL GRADES

Week Ending.....	Oct. 3	Oct. 10	Oct. 17	Oct. 24	Oct. 31	Nov. 7	Nov. 14	Nov. 21	Nov. 28	Dec. 5	Dec. 12	Dec. 19	Jan. 9	Jan. 16	Jan. 23	Average Percent of Class Time Devoted to Supervised Study during the 15 Weeks.
	GRADES IV–VI															
English.....		47	57	49	43	44	42	53	47	30	37	55	44	46	45	46
Arithmetic.....	37	52	26	60	51	60	61	59	48	55	56	48	53	55	51	51
History.....	28	44	24	44	52	54	55	43	46	38	35	47	42	40		42
Science.....		12	20	50	50	29	52	54	56	45	51	50	52	51	53	45
Spelling and writing.....	54	55	59	56	50	60	47	52	44	53	62	44	55	65	53	55
Art.....	73	42	63	55	38	67	67	67	67	67	67	67	67	67	67	63
Geography.....	37	38	31	47	50	51	50	49	50	42	35	45	46	47		43
Average.....																49
	GRADES VII–IX															
Home economics..			57	52	59	64	73	64	68	82	71	64	73	90		69
English.....		33	64	39	41	50	47	37		65	39	57	60	80	65	52
Geography.....	42	46	54		56	59	66	50	42	64	61	75	48	50	55	55
Mathematics.....	36	18	18	57	60	64	57	81	28	35	52	63	50	56	53	47
English.....	56	57	44	70	60	59	62	62		61	60	59	64	53	67	60
Latin.....	37	45	68	60	72	27	78	72	83	94	70		67	80	77	66
Civics.....	33	8	19	30	35	44		34	37	53	42	18	39	31	16	29
Mathematics.....	32	48	51	46	53	62	74	63	64	82	74	55	73	34	83	60
Science.....	57	44	50	51	35	69	84	67	64	41	44*	54	46	54	43	54
Art.....	15	9	83	81	78	63	84	78	61	77	84		39	66	69	63
Home economics..	26		7	43	47	42	80	54	80	85	66	54	71	35		53
Average.....																55

*See Table I.

of the subject, since it requires a great deal of discussion about local affairs, a discussion in which all pupils of the class are able and eager to take part. On the other hand, one mathematics teacher used only 47 percent while another used 60 percent. One home-economics teacher used 69 percent while the other used only 53 percent.

It is undoubtedly true, also, that many teachers have a predilection for recitation work. For this reason some superintendents claim that the arbitrary time system is necessary. On the other hand, if weekly reports on the amount and distribution of time are required, there are likely to be few teachers who will take an undue amount of time in recitation work. Moreover, such reports form a natural basis for conference with the teacher with the result that excesses in either direction may be prevented through mutual agreement.

EFFICIENCY IN LEARNING AND THE ACCOMPLISHMENT RATIO

FLORENCE L. GOODENOUGH
University of Minnesota

During the past few years, educational journals have published a number of articles dealing with the use of the accomplishment ratio[1] as a means of comparing native ability and scholastic achievement. It is assumed that if the score which a child makes on an intelligence test is equal to that made by the average ten-year-old, then he should also do as well as the ten-year-old on standardized educational tests in the school subjects. His accomplishment ratio would then be equal to 100. If his educational rating is in advance of his intelligence rating his accomplishment ratio will be greater than 100, and if this difference is in excess of that which may be expected by chance,[2] it is usually held to be an indication that the child has made better than average use of his intellectual endowment in acquiring a mastery of the school subjects. Similarly, if his rating on the educational tests is significantly less than that earned on the intelligence test, it is considered that the learning process has for some reason been less than ordinarily efficient. Variation in application and effort on the part of the children or differences in the efficiency of teaching methods are usually cited as the basis for discrepancies of this sort.

It has almost universally been found that a negative correlation exists between intelligence and accomplishment as the latter is measured by the accomplishment ratio. Franzen in his experimental work at Garden City found a correlation of — 0.61 between I. Q. and A. R. at the beginning of his study, and of

[1] The accomplishment ratio or A. R. is found by dividing the educational age by the mental age.

[2] Chapman, J. C. "Unreliability of the Difference between Intelligence and Educational Ratings," *Journal of Educational Psychology*, 14:103-108, February, 1923; Herring, J. P. "The Reliability of Accomplishment Differences," *Journal of Educational Psychology*, 15:530-38, November, 1924.

—0.49 after a year and a half of intensive training designed especially to coordinate ability and achievement.[3] Similar findings have been reported by other investigators. The reason usually ascribed is that the slow pupil is stimulated to special effort both by the example of his brighter classmates and by the constant urging and attention of the teacher who is anxious to keep up the general standing of her class, while the bright child who is able to keep up to the group without effort has no particular incentive to cause him to do better than average work.

There is little doubt but that our public schools commonly fail to provide the training best suited to especially bright children, and that as a result many such children fail to establish really efficient work habits. There is, however, another factor in the situation which is not given sufficient weight in the theory of the accomplishment ratio. Learning is a function of time as well as of ability. The child with an I. Q. of 150 enters school at the age of six with a mental age of approximately nine years, while the child whose intelligence quotient is 100 ordinarily receives from two to three years of school training before reaching that mental level. Accordingly, if the first child is to show an accomplishment ratio equal to that of the second child, it becomes necessary for him to acquire over-night, as it were, a knowledge of the school subject-matter equivalent to that which the generality of school children take from two to three years to obtain. The intelligence quotient is operative from the time of birth; the specific learning processes upon which the educational quotient depends do not ordinarily begin until the time of school entrance, that is, at about the age of six years.

It is evident that the use of the accomplishment ratio as a criterion for determining the efficiency of work habits in school children is open to criticism in all cases in which the intelligence quotient departs materially from 100, unless it can be shown that proficiency in the school subjects is entirely independent of the length of school attendance. It is true that bright children are

[3] Franzen, Raymond. *The Accomplishment Ratio.* New York, Teachers College, Columbia University, 1922. 59 pp. (Teachers College, Columbia University, Contributions to Education, No. 125)

more likely to acquire the rudiments of reading and number work before entering school than are backward children, but this factor is by no means adequate to make up the difference in the length of formal educational training which has, on the average, been undergone by superior, average, and backward children of the same mental age. The extent of this difference is indicated by Table I, which shows the approximate number of semesters of school attendance for children of different intellectual

TABLE I. LENGTH OF SCHOOL ATTENDANCE AT VARIOUS MENTAL AGES FOR CHILDREN OF DIFFERENT INTELLECTUAL LEVELS

Intelligence Quotient	Length of Attendance in Semesters if Mental Ages Are as Indicated				
	8–0	10–0	12–0	14–0	16–0
140	0	2	5	7	10
120	1	4	7	11	14
100	3	7	11	15	19
80	7	12	17		
60	14				

Table reads: A child whose intelligence quotient is 140, if he has a mental age of eight, will normally have had no school attendance; if he has a mental age of ten, he will have attended 2 semesters; if he has a mental age of twelve, he will have attended 5 semesters; etc.

levels (intelligence quotients) at various mental ages, assuming six years three months as the age at school entrance in all cases.

It may be seen from Table I that a child whose rate of mental growth is 40 percent more rapid than average must acquire academic knowledge at more than three times the ordinary rate in order to show an A. R. of 100 at the mental age of ten. In other words, he will have but two semesters in which to learn what the average child learns in seven semesters. Statistics show that as a rule he fails to accomplish this, although his superior mental age does enable him to progress at a rate which is much more than 1.4 times that of the average child. Ability, it appears, is a more important factor in the situation than time, but this fact does not warrant complete disregard of the time element.

Another point which should not be overlooked is the matter of grade classification. It has frequently been pointed out that our public schools are organized in such a way that children are

promoted on the basis of age, rather than ability or accomplishment. The effect of this practice upon the accomplishment ratio is discussed in a recent article by Torgerson and Shuman[4] who find that among children of the same mental age, those in the lower grades have high intelligence quotients and low accomplishment ratios and that they are younger chronologically. The authors of this article feel that the failure to permit these children to advance into the upper grades where they would deal with more difficult subject-matter is the cause of their lower accomplishment ratios, and that classification according to mental age would equalize the accomplishment ratios of different intellectual groups. Torgerson and Shuman show that when the school grade is also kept constant, the average accomplishment ratio of children with intelligence quotients above 105 does not differ greatly from that of children with intelligence quotients between 95 and 105 or below 95. Their data are inadequate, however, not only on account of the small number of cases involved in their study, but also because of the obvious impossibility of determining whether the superior educational accomplishment of the bright children in this selected group was the result or the cause of their school advancement. In other words, it is likely that the method of Torgerson and Shuman would tend to select the most studious members of the group with intelligence quotients above 105, and all other factors being equal, it is to be expected that their accomplishment ratios would be somewhat in advance of those of other members of their group.

Conclusions

1. The accomplishment ratio does not afford a valid means for comparing the learning efficiency of individuals or of groups who differ widely in intelligence.

2. We are not justified, on the basis of such a comparison, in assuming that bright children are less efficient in their learning habits than are backward or mediocre children.

---

[4] Torgerson, T. L. and Shuman, Irene. "The Variability of the Accomplishments of Pupils of the Same Mental Level," *Journal of Educational Research*, 11:132-36, February, 1925.

THE LITERATURE AND PROBLEMS OF SCHOOL BUILDINGS

JOHN C. ALMACK
Stanford University

(Continued from October)

II. BUILDING PLANNING AND CONSTRUCTION

Most of the literature on the planning and construction of school buildings is of a practical sort; little careful investigating has been done. The sizes of classrooms are traditional, and the method of natural lighting in vogue illustrates a common tendency to accept without question, the statement of an authority. Although architectural changes have been many, there is still a disposition to defend outworn ideas of construction. When planning a new building it is still the custom for the superintendent and the school board to make pilgrimages about the country, inspecting in a more or less cursory fashion the school plants along the way. Architects are still selected blindly, and the so-called competitions do not always result in the employment of the most competent. All investigators emphasize the need of an informed educational influence in drawing up and executing the plans for school buildings.

Six main problems are included in this section: selecting the architect, planning the building, planning building details, planning the classrooms, planning special rooms, and selecting and utilizing the site.

VII. SELECTING THE ARCHITECT—

64. Beach, W. W. "What Kind of Architect Do You Employ?" *American School Board Journal*, vol. 64, no. 4, pp. 38, 135, April, 1922.
65. Cook, Walter. "An Experience in Schoolhouse Competition," *American School Board Journal*, vol. 44, no. 6, pp. 10-12, December, 1912.
66. Donovan, John J. "The Relations between Boards of Education, Their Superintendents, and Their Architects," *Proceedings of the National Education Association*, 1917. pp. 369-72.
67. Milligan, R. M. "The School Board, the Architect, and the Builder," *American School Board Journal*, vol. 61, no. 3, pp. 37-40, 95-97, September, 1920.
68. Perkins, Dwight H. "What Service Should the School Architect Render?" *American School Board Journal*, vol. 67, no. 6, pp. 64-65, July, 1923.

See also 9, 10, 14, 28, 70, 75, 77, 84, 88, 100, 107, 108, 116, 117.

VIII. PLANNING THE BUILDING—

The study of space distribution and the standardization of space requirements were the noteworthy achievements of a National Education Association committee of which Frank Irving Cooper was chairman. Much still remains to be done, for example, the arrangement of rooms within the school building has not been planned with that care which characterizes industrial construction. Departmental buildings are, as a rule, most inconvenient. We do not know whether it is better to group our teaching centers, the classrooms, by subject or by grade. There is also some controversy over the relative merits of one- and two-story buildings, and the problem of proper flexibility in planning is still with us.

A. Standards and regulations.—

69. Cooper, Frank Irving. "Regulations for Schoolhouse Construction, in the United States in the Year 1920," *Proceedings of the National Education Association*, 1920. pp. 518-23.
70. Donovan, John J. "State Bureaus for Regulating and Directing the Building of Schools," *American School Board Journal*, vol. 64, no. 1, pp. 50-51, January, 1922.
71. Hart, Frank W. *A Standard Schoolhousing Code.* Albany, New York, C. F. Williams and Son, 1924. 172 pp.
72. National Education Association. *Schoolhouse Planning.* Report of the Committee of the National Education Association, Frank Irving Cooper, chairman. Lynn, Massachusetts, Nichols Press, 1925. 164 pp.
73. "School-Building Standards," *American School Board Journal*, vol. 69, no. 4, pp. 54, 129-30, October, 1924. (Report of special committee of the American Institute of Architects)

B. School-building plans—

74. Challman, Samuel A. "What Type of School Building Is the Best All-Around Investments?" *American School Board Journal*, vol. 57, no. 6, pp. 45, 73-75 and vol. 58, no. 1, pp. 28, 78, December, 1918 and January, 1919.
75. Collins, D. C. N. "The Administration of Schoolhouse Construction," *American School Board Journal*, vol. 42, no. 4, pp. 3-4, 52-53, April, 1911.
76. Cooper, Frank Irving. "The One-Story Schoolhouse," *The American Architect and Architectural Review*, 117:451, April 7, 1920.
77. Hollister, Horace A. *The Planning and Construction of High-School Buildings.* Urbana, Illinois, University of Illinois, 1916. 67 pp.
78. Hussander, A. F. "Planning the School Buildings of Chicago," *Proceedings of the National Education Association*, 1919. pp. 353-57.
79. Koos, Leonard V. "Space Provisions in the Floor Plans of Modern Elementary-School Buildings," *Elementary School Journal*, 20: 12-25, September, 1919.
80. ——— "Space Provisions in the Floor Plans of Modern High-School Buildings," *School Review*, 27: 573-99, September, 1919.
81. McCornack, W. R. "Economy in Schoolhouse Planning and Construction," *Proceedings of the National Education Association*, 1920. pp. 333-35.
82. Perkins, Dwight H. "The Advantages of the One-Story Plan," *Proceedings of the National Education Association*, 1922. pp. 1359-61.

83. Womrath, G. F. "Minneapolis Two-Story Composite School," *American School Board Journal*, vol. 60, no. 1, pp. 48-49, 68, January, 1920.
84. Woodridge, C. L. "Standard Units in Schoolhouse Planning," *American School Board Journal*, vol. 56, no. 3, pp. 33-34, March, 1918.

C. Types and examples of buildings—

85. Allen, J. E. "Economical Small Buildings," *American School Board Journal*, vol. 57, no. 3, pp. 39-42, 79, September, 1918.
86. Bentley, J. H. "Junior High-School Buildings," *Proceedings of the National Education Association*, 1922. pp. 400-404.
87. Cahlwell, Otis W. "The New Lincoln School Building," *Teachers College Record*, 24: 1-6, January, 1923.
88. Clerk, F. E., and others. "The Comprehensive School Building—a Symposium," *Proceedings of the National Education Association*, 1921. pp. 630-40.
89. Cobb, C. R. "The New Bessemer Grade and Community Building," *American School Board Journal*, vol. 65, no. 2, pp. 56-57, 125, August, 1922.
90. Dickey, C. W. "The New Oakland School," *American School Board Journal*, vol. 66, no. 1, pp. 47-49, January, 1923.
91. Harrington, H. E. "The Detroit Standard Intermediate-School Building," *American School Board Journal*, vol. 65, no. 1, pp. 56-59, July, 1922.
92. Howard, O. D. "New School Buildings at Springfield, Ohio," *American School Board Journal*, vol. 66, no. 5, pp. 61-63, May, 1923.
93. Ittner, William B. "Modern School Plants in the South," *American School Board Journal*, vol. 64, no. 1, pp. 49-52, January, 1922.
94. Longanecker, F. M. "Three Junior High Schools," *American School Board Journal*, vol. 66, no. 4, pp. 59-64, April, 1923.
95. Malcolm, David J. "The Crane Community School, Windsor, Massachusetts," *American School Board Journal*, vol. 66, no. 4, pp. 54-55, April, 1923.
96. Mills, Byron E. "The Walled Lake Community School," *American School Board Journal*, vol. 66, no. 5, pp. 64-65, 141, May, 1923.
97. McCullough, A. M. "A Grade School," *American School Board Journal*, vol. 67, no. 1, p. 61, July, 1923.
98. Neverman, P. F. "New School Group at Marinette, Wisconsin," *American School Board Journal*, vol. 63, no. 5, pp. 51-53, 111, November, 1921.
99. Price, Pedr. "The New Junior High School at Futuria," *American School Board Journal*, vol. 56, no. 2, pp. 19-20, no. 3, pp. 32-33, no. 4, pp. 33-35; February, March, and April, 1918.
100. Weeks, William H. "Architectural Achievements in California," *American School Board Journal*, vol. 67, no. 5, pp. 51-60, November, 1923.

See also 2, 11, 16, 18, 27, 28, 29, 35, 68, 104, 107, 108, 114, 117.

IX. PLANNING BUILDING DETAILS—

The information on building details is found mainly in codes, specifications, surveys, and general textbooks on school buildings. Although such problems are architectural, the school administrator needs to be able to recognize and correct bad planning. He is interested in details for the sake of economy, safety, sanitation, and convenience, not to mention educational adaptability.

101. Arnold, G. L. H. "Factory Stairs and Stairways," *The American Architect and Architectural Review*, 117: 129-34, January 23, 1920.

102. Cushman, J. M. "Effect of Plaster on Quiet Condition of Rooms," *American School Board Journal*, vol. 51, no. 5, pp. 33, 37, November, 1916.
103. Cummins, R. A. "Small Items of Great Significance in the Building of Schools," *American School Board Journal*, vol. 58, no. 2, pp. 37-38, February, 1919.
104. Donovan, John J. "Odds and Ends about the Building of Schools," *American School Board Journal*, vol. 60, no. 4, p. 41, April, 1920.
105. Heckel, G. B. "Painting School Buildings," *American School Board Journal*, vol. 53, no. 5, pp. 24, 48, November, 1917.
106. ——— "Colors and Surfaces for Schoolroom Walls and Ceilings," *American School Board Journal*, vol. 52, no. 2, pp. 25-26, February, 1917.
107. Ittner, William B. "Mooted Questions in School-Building Service," *Proceedings of the National Education Association*, 1922. pp. 1425-28.
108. Johnston, M. M. "Unsatisfactory Features of School Buildings," *American School Board Journal*, vol. 53, no. 6, pp. 43-44, December, 1917.
109. Murphy, C. O. "The Responsibility in School Walls," *American School Board Journal*, vol. 34, no. 2, pp. 3-5, February, 1907.
110. Rosenblatt, M. C. "Schoolhouse Acoustics," *American School Board Journal*, vol. 64, no. 1, pp. 45-46, January, 1922.
111. Sabine, Paul E. "Architectural Acoustics," *American Architect and Architectural Review*, 118: 102-108, July 28, 1920.
112. Sexton, R. W. "Color Schemes for Schoolrooms," *American School Board Journal*, vol. 64, no. 6, pp. 55-56, June, 1922.
113. Watson, F. R. *Sound-Proof Partitions*, Urbana, Illinois, University of Illinois, 1922. p. 85. (Department of Architectural Engineering, Bulletin No. 127.)

See also Ohio, New Jersey, New York, Indiana, Michigan codes; and 13, 19, 23, 27, 28, 34, 35, 69, 71, 79, 80, 84, 117, 118, 130.

X. PLANNING THE CLASSROOMS—

Classroom standards are in the main arbitrary and traditional. A survey of school reports, surveys, codes, and textbooks shows that classrooms vary little in size and shape.

A. General texts —
114. Ayres, Leonard P. "School Buildings and Equipment," *Cleveland School Survey*. Philadelphia, William F. Fell Company, 1916. 117 pp.
115. Ayres, May, and others. *Healthful Schools*. Boston, Houghton Mifflin Company, 1918. 459 pp.
116. Cubberley, E. P. *Public-School Administration*. Boston, Houghton Mifflin Company, 1916. 479 pp.
117. Donovan, John J. *School Architecture*. New York, Macmillan Company, 1921. 724 pp.
118. Earl, E. C. *The Schoolhouse*. Washington, D. C., Gaylord Brothers, 1919. 20 pp.
119. Moore, J. A. *The Schoolhouse*. Boston, Griffith-Stillings Press, 1915. 204 pp.

B. Classroom lighting—
120. Berkowitz, J. H. *The Eyesight of School Children*. Washington, D. C., Superintendent of Documents, 1919. 128 pp. (United States Bureau of Education, Bulletin No. 65.)
121. Doane, Ralph H. "Sunlighting the Public-School Classrooms," *American School Board Journal*, vol. 62, no. 4, pp. 35-36, March, 1921.
122. Gehring, A. "Defects in School Lighting and Their Remedy," *American School Board Journal*, vol. 59, no. 4, p. 34, April, 1917.
123. ——— "Unilateral and Bilateral School Lighting." *American School Board Journal*, vol. 58, no. 4, p. 47, April, 1919.

124. Hallet, R. L. "The Influence of Paint on Interior Illumination," *Transactions of the Illuminating Engineers' Society*, 18: 338-46, April, 1923.
125. Jackson, Edward. "Daylight in the Schoolroom," *Proceedings of the National Education Association*, 1921. pp. 308-15.
126. Luckiesh, M. and Holladay, L. L. "The Cost of Daylight," *Transactions of the Illuminating Engineers' Society*, 18: 119-42, February, 1923.
127. "Paint as a Factor in Illumination," *American Architect and Architectural Review*, 122: 249-52, September 13, 1922.
128. Rapeer, L. W. "The Case against Unilateral Lighting." *American School Board Journal*, vol. 57, no. 1, pp. 33-34, July, 1918.

C. Texts in school hygiene—

129. Burgerstein, Leo. *Handbuch der Schulhygiene*. Leipsig, 1912. Also translation by Stevenson and Van Osten. New York, Frederick Stokes Company, 1915. 188 pp.
130. Dresslar, Fletcher B. *School Hygiene*. New York, Macmillan Company, 1913. pp. 32, 109.

See also 13, 27, 28, 71, 79, 80, 106, 131, 170, 180.

XI. PLANNING SPECIAL ROOMS—

Without a large number of special rooms the conventional school building cannot meet the demands of social activities, the enriched curriculum, and wider community use. Educational and architectural problems are here presented—problems of location, arrangement, size, form, construction, and duplicate uses.

131. Bailey, Edna W., and Foster, Laurence F. "A Science Laboratory and Classroom for Secondary Schools," *American School Board Journal*, vol. 66, no. 1, pp. 57-59, 125, January, 1923.
132. Berkowitz, J. H. *The Standardization of Medical Inspection Facilities*. Washington, D. C., Superintendent of Documents, 1919, 22 pp. (United States Bureau of Education, Bulletin No. 2)
133. Brown, Grace L., and Janney, Grace M. *The Housing and Equipment of Kindergartens*. Washington, D. C., Superintendent of Documents, 1921. 27 pp. (United States Bureau of Education, Bulletin No. 13)
134. Certain, C. C. "The School Library as a Problem in Architectural Design," *Proceedings of the National Education Association*, 1922. pp. 1280-85.
135. Challman, Samuel A. "Rooms and Equipment for a Department of Agriculture," *American School Board Journal*, vol. 66, no. 1, pp. 42-43, January, 1923.
136. ———— "Space Requirements for Home Economics," *American School Board Journal*, vol. 64, no. 1, pp. 41-43, January, 1922.
137. Ewing, William F. "Administrative Offices in School Buildings," *American School Board Journal*, vol. 58, no. 4, pp. 33-35, no. 5, pp. 41-42, April and May, 1919.
138. Ittner, William B. "Essential Considerations in Planning Gymnasiums and Pools for Present-Day Use," *American School Board Journal*, vol. 66, no. 1, pp. 74-75, January, 1923.
139. Richards, W. A. "The Selecting of Equipment for, and the Planning of, School Shops," *American School Board Journal*, vol. 44, no. 1, pp. 14, 71, July, 1912.
140. Wyatt, E. M. "A Compact Woodwork Shop," *American School Board Journal*, vol. 66, no. 1, pp. 62-63, January, 1923.

See also 2, 3, 4, 5, 6, 8, 13, 16, 19, 27, 28, 79, 80, 87, 89, 91, 98, 117, 118, 119.

XII. SELECTING AND UTILIZING THE SCHOOL SITE—

141. Brainard, W. H. "Sanitary Conditions in School-Building Sites," *American School Board Journal*, vol. 47, no. 5, pp. 16-18, November, 1913.
142. Balthis, Frank K. "Beautifying Village School Grounds," *American School Board Journal*, vol. 66, no. 5, pp. 43-45, May, 1923.
143. Crocker, Orin W. "Beautifying Rural School Grounds," *American School Board Journal*, vol. 63, no. 6, pp. 42, 112, December, 1921.
144. Curtis, Henry S. *School Grounds and Play*. Washington, D. C., Superintendent of Documents, 1921. 31 pp. (United States Bureau of Education, Bulletin No. 45)
145. Donovan, John J. "School Grounds and Buildings," *Proceedings of the National Education Association*, 1915. pp. 1041-46.
146. Dresslar, Fleteher B. "Some Problems to Be Considered in the Selection of Sites for School Buildings," *Proceedings of the National Education Association*, 1915. pp. 951-55.
147. McCurdy, James H. "School Environment for Health," *Proceedings of the National Education Association*, 1919. pp. 369-73.
148. Miller, Louise Klein. "Improvement of School Grounds," *American School Board Journal*, vol. 64, no. 5, pp. 41-45, May, 1922.
149. Ramsdell, Charles H. "School-Ground Planning as a Community Asset," *American School Board Journal*, vol. 60, no. 4, pp. 36-38, 117, April, 1920.
150. Ward, D. "Developing the Playgrounds of a Small City," *American School Board Journal*, vol. 44, no. 3, pp. 8-9, September, 1912.

See also 13, 18, 19, 27, 28, 34, 45, 69, 89, 91, 114, 115, 117, 118, 119, 129.

III. FURNISHING AND EQUIPPING THE SCHOOL

Four problems are here considered: heating and ventilating, artificial lighting, water supply and sanitary system, and classroom and special-room equipment.

The discussions of these topics are to be found in surveys, reports, and current articles. We have no single text which deals with all of them. Ventilation and lighting have been rather thoroughly investigated by students in this country, but foreign studies are generally out of date.

XIII. HEATING AND VENTILATING—

Each succeeding investigation of ventilation usually has caused a revolution in practice and has overthrown ancient and popular beliefs. The recent study of the New York Commission supplies the best scientific basis we have, although one may not accept all the conclusions without question.

151. "Air Testing Devices," *American School Board Journal*, vol. 57, no. 3, p. 80, September, 1918.
152. "Air Washers," *Transactions American Society of Heating and Ventilating Engineers*, 1910. pp. 136-43.
153. Alt, Harold L. *The Mechanical Equipment of School Buildings*. Milwaukee, Bruce Publishing Company, 1916. 111 pp.
154. Baldwin, E. C. "Two Systems of Heating and Ventilation," *American School Board Journal*, vol. 59, no. 3, pp. 48-51, 101, September, 1919.

155. Carpenter, R. C. *Heating and Ventilating Buildings.* New York, John Wiley and Sons, 1915. 598 pp.
156. Eddy, C. A. "Meeting Today's School Needs with Mechanical Ventilation," *American School Board Journal*, vol. 66, no. 2, pp. 68-70, February, 1923.
157. Hallet, Edwin S. "Mechanical versus Window Ventilation," *American School Board Journal*, vol. 67, no. 2, pp. 46-47, August, 1923.
158. ——— "Testing the Heating and Ventilation of School Buildings," *American School Board Journal*, vol. 64, no. 5, pp. 60, 126, May, 1922.
159. Howatt, John. "Heating and Ventilation of Chicago Schools," *American School Board Journal*, vol. 67, no. 4, pp. 37-38, 123, October, 1923.
160. Hubbard, Charles L. "The Effect of Recent Investigations upon Design and Operation of Heating and Ventilating Equipment," *The American Architect and Architectural Review*, 119: 367-72, March 23, 1921.
161. Kimball, D. D. "What the New York Commission Did and Why," *American School Board Journal*, vol. 67, no. 2, pp. 47-48, 109, August, 1923.
162. Lewis, Samuel R. "Some Phases of the Planning and Installation of School Heating and Ventilating Equipment," *American School Board Journal*, vol. 66, no. 1, pp. 38-40, January, 1923.
163. ——— "Ventilating with Window Inlets," *American School Board Journal*, vol. 66, no. 1, pp. 51-52, June, 1923.
164. Mahar, James A. "An Analysis of the Cost of the Heating and Ventilating System of a School Building," *American School Board Journal*, vol. 67, no. 1, pp. 47-48, July, 1923.
165. *Ozone in Ventilation.* United States Public Health Reports, Washington, D. C., Government Printing Office, January-June, 1920.
166. Redway, Jaques W. "Some Fallacies of Mechanical Ventilation," *American School Board Journal*, vol. 61, no. 4, pp. 36, 96, October, 1920.
167. ——— "Humidity of Air in Schoolrooms," *American School Board Journal*, vol. 51, no. 1, pp. 36, July, 1915.
168. *Ventilation.* Report of the New York State Commission. New York, E. P. Dutton and Company, 1923. 620 pp.
169. Westover, H. E. "Unit System of Heating and Ventilating," *American School Board Journal*, vol. 61, no. 1, pp. 38-40, July, 1920.
See also 13, 18, 26, 27, 28, 34, 45, 69, 71, 114, 115, 117, 118, 119, 129.

XIV. ARTIFICIAL LIGHTING—

One of the earliest and best studies of lighting was made by Herman Cohn in 1868. The reports of his work are largely responsible for the unilateral lighting throughout this country and for the development of methods of light measurement, devices for which are now well standardized. The most thorough-going study of school lighting is that made by the New York Commission's study of ventilation. Aside from Freeman's work, most of the recent investigations in artificial lighting have been made in industry. There is a belief that the lighting standards established by the Illuminating Engineers are too high. The whole subject demands careful and scientific investigation.

170. Anderson, E. A. "Illuminating Standards," *Electrical Review*, 78: 411-15, March, 1921.

171. Augustine, Reginald C. "School Illumination and the Vision of Students," *American School Board Journal*, vol. 64, no. 2, pp. 49-50, 86, February, 1922.
172. Caldwell, F. C. "Good Lighting in Schools," *Transactions of Society Illuminating Engineers*, 15: 321-33, July, 1920.
173. "Code of Lighting School Buildings," *American School Board Journal*, vol. 69, no. 4, pp. 48-49, 137, October, 1924. (Also issued by the Illuminating Engineering Society and the American Institute of Architects)
174. Freeman, Frank N. "Illuminating Requirements of School Buildings," *Proceedings of the National Education Association*, 1919. pp. 339-53.
175. Lelleck, J. K. "Indirect Lighting of School Rooms," *American School Board Journal*, vol. 49, no. 10, pp. 15-16, 68, December, 1914.
176. "Nomenclature and Standards for Illuminating Engineers," *Transactions Society Illuminating Engineers*, 18: 47-61, January, 1923.
177. Powell, A. L. "Modern Methods of Artificial Illumination," *American Architect and Architectural Review*, 125: 133-40, January 30, 1924.
178. Spalding, H. T. and Palmer, R. A. "Artificial Lighting in the Schools," *American School Board Journal*, vol. 64, no. 6, pp. 41-44, June, 1922.
See also 13, 18, 27, 28, 71, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 151.

XV. WATER SUPPLY AND SANITARY SYSTEM—

Discussions of this subject are usually concerned with advice in the selection of drinking facilities and the equipment of toilets. With the extension of the activities of the school many new problems have arisen, such as the supplying of water for domestic purposes, the filtration and sterilization of water in pools, and the purification and cooling of drinking water. Surveys offer many suggestions on ordinary equipment of this sort, but they have little to offer on the newer problems.

179. Horton, Theodore, and Chase, E. Sherman, "A Study of the Application of the Score System to the Sanitary Quality of Public Water Supplies in New York State," *American Journal of Public Health*, 7: 380-90, April, 1917.
180. Mason, W. P. *Water Supply*. 4th. Ed. New York, John Wiley and Sons, 1918. 504 pp.
181. Stein, M. F. *Water Purification Plants and Their Operation*. New York, John Wiley and Sons, 1915. 258 pp.
182. Phelps, Erle B. *Chemical Disinfection of Water*. Washington, D. C. United States Public Health Service, October 5, 1914. Reprint 225. 11 pp.
183. Wegann, Edward. *Chlorine Control Apparatus for Water and Sewer Purification*. New York, Wallace Tiernan Company, 1915. 36 pp.
184. ———— *Conveyance and Distribution of Water for Water Supply*. New York, D. Van Nostrand Company, 1918. 663 pp.
See also 13, 18, 27, 28, 109, 114, 117.

XVI. CLASSROOM AND SPECIAL-ROOM EQUIPMENT—

Few studies have been made of school equipment, although surveys do consider the size, placement, and sanitary condition of desks. Social methods, platoon organization, and community

activities all tend to increase the educator's appreciation of movable, durable, and flexible school furniture.

185. Anderson, C. A. "Tentative Score Card for Elementary-School Desks and Seats," *American School Board Journal*, vol. 69, no. 1, pp. 46-47, July, 1924.
186. Bennett, H. E. "Some Requirements for Good Seating," *Elementary School Journal*, 23: 203-15, November, 1922.
187. Clark, R. V. "Sanitary School Furniture and Equipment," *American School Board Journal*, vol. 42, no. 3, p. 8, March, 1911.
188. Dobbs, Ella V. "Equipping and Furnishing the Modern School," *Proceedings of the National Education Association*, 1919. pp. 191-93.
189. Dresslar, Fletcher B. "School Apparatus," *American School Board Journal*, vol. 42, no. 1, pp. 4, 44, July, 1911.
190. Dunlop, John Y. "School Furnishing in England," *American School Board Journal*, vol. 45, no. 1, pp. 16-17, no. 2, 15, July and September, 1912.
191. Johnston, J. M. "The Location of School Blackboards," *American School Board Journal*, vol. 56, no. 3, pp. 35-36, March, 1918.
192. Kilpatrick, V. E. "Innovations in School Furniture," *American School Board Journal*, vol. 48, no. 7, pp. 13, 64, January, 1914.
193. "Movable Furniture for Schools," *American School Board Journal*, vol. 42, no. 1, pp. 22-23, 42, July, 1911.
194. Lovett, R. W. "Relation of School Life to Lateral Curvature of the Spine," *Proceedings Sixth Congress, American School Hygiene Association*, 1912. pp. 174-79.

See also 27, 34, 114, 115, 117, 129, 130.

IV. Building Safety and Sanitation

Two leading problems are included under this heading: providing for safety and keeping the building and equipment clean and sanitary. Since the problems in this field have not as yet invited thorough investigation, there is little reliable information available.

XVII. PROVIDING FOR SAFETY—

195. Ayres, May. "Fire Protection in Public Schools," *American School Board Journal*, vol. 47, no. 3, pp. 11-13, September, 1913.
196. Cooper, Frank Irving. "Perils of Schoolhouse Construction," *American School Board Journal*, vol. 42, no. 4, p. 2, April, 1911.
197. ——— "Schoolhouses and the Fire Hazard," *Proceedings of the National Education Association*, 1916. pp. 764-67.
198. Fiske, Henry A. "An Analysis of Where Fires Start in Schools, Institutions, and Hotels," *American School Board Journal*, vol. 62, no. 4, pp. 51 101, March, 1921.
199. Forster, H. W. *Fire Protection for Schools.* Prepared and printed for the Department of the Interior, Bureau of Education, by the National Fire Protection Association, 87 Wills Street, Boston, Massachusetts, 1919, 48 pp.
200. ——— "Fire Protection for Schools," *American Architect and Architectural Review*, 117: 264-65 and 289-93, February 25 and March 3, 1920.
201. Ittner, William B. "Safety of Life in Schoolhouse Plans—A Symposium," *Proceedings of the National Education Association*, 1921. pp. 623-30.

202. Johnston, William W. "Safe Construction of School Buildings," *American School Board Journal*, vol. 54, no. 4, pp. 15-16, April, 1917.
See also 13, 27, 34, 114, 115, 117, 130.

XVIII. CLEANING AND SANITATION—

203. "A School for Janitors," *School Buildings and Grounds*, Semiannual Report, Division of Reference and Research, Board of Education, New York, 1915. Albany, Education Department, 1917. 440 pp.
204. Cook, William A. *Schoolhouse Sanitation*. Washington, D. C., Superintendent of Documents, 1915. 69 pp. United States Bureau of Education, Bulletin No. 21, 1915.
205. Cooley, M. S. "Vacuum Cleaning in Schools," *American School Board Journal*, vol. 57, no. 3, p. 27, September, 1918.
206. Dresslar, Fletcher B. "Cleaning and Sanitation of School Buildings," *St. Louis Survey*. St. Louis, Board of Education, Part II. 1917. 288 pp.
207. Lambert, John. "Preparations for the Prevention of Dust in Schools," *The Child*, 2:279-89, January, 1912.
208. McClintic, T. B. *Disinfectants, Their Use and Application in the Prevention of Communicable Diseases*. United States Public Health Bulletin, No. 92, 1912.
209. Miekens, Charles W. "Janitorial Supervision in Highland Park, Michigan, 1917-18," *American School Board Journal*, vol. 56, no. 1, pp. 30-31, and no. 2, pp. 33-34, January and February, 1919.
210. Perry, T. D. "Specifications for Vacuum Cleaning Equipment," *American School Board Journal*, vol. 42, no. 1, pp. 7, 19, January, 1911.
211. Reeves, Charles E. *An Analysis of Janitor Service in Elementary Schools*. New York, Teachers College, Columbia University, 1925. pp. 194.
212. "Swimming Pool Sanitation," *American School Board Journal*, vol. 65, no. 3, pp. 62-63, September, 1922.
213. "The Housekeeping Function of the Principal and of the Janitor," *American School Board Journal*, vol. 67, pp. 82, 84, November, 1923.
214. Van Oot, B. H. "Analysis of the School Janitor's Job," *American School Board Journal*, vol. 66, no. 5, pp. 55-56, 146, May, 1923.

V. Bibliography on the School Building

No complete bibliography on the school building has been published. Certain such phases of the problem as hygiene and architecture have been fairly well covered, but they are not up to date. There are, however, a few good references in the latest books on school administration.

215. "Bibliography; School Hygiene. (1881-1904)." *Proceedings of the National Education Association*, 1906. pp. 718-19.
216. Burnham, William H. "Bibliography of School Hygiene," *Proceedings of the National Education Association*, 1898. pp. 505-23.
217. "School Architecture, Bibliography (1869-1905)." *Proceedings of the National Education Association*, 1906. p. 663.
218. Stevenson, P. R. "A School-Building Bibliography," *Educational Research Bulletin*, 2:257-60 and 272-75, October 17 and 31, 1923.
219. Titcomb, W. C. "School Architecture; Bibliography," *Architectural Record*, 49: 358-71, April, 1921.
See also, 11, 13, 71, 115, 116, 117, 121, 129, 130, 132, 168, 186.

Editorials

THE GREATEST WASTE IN EDUCATION

It is entirely proper to study waste in education as one studies waste in industry. To the advantage of all concerned one may examine the cost of equipment, supplies, and service, on the one hand, and the value of the product, on the other. This is nothing more than good business. Moreover, as everybody is now pointing out, the development of measures of achievement in school work has made possible a valuation of product which, but a short time ago, existed only in the dreams of a few visionaries.

But the industrial analogy does not carry us far enough. The product of the forge, the shop, and the factory is a lifeless product. If it is shoes, these mere things cannot move or talk or have ideas. They cannot learn or acquire habits or possess ideals. They are just shoes, to be shipped here or there, to be put on display, to be shut up in boxes, and ultimately to be "consumed" by some person who has enough equivalence of labor in the form of money to purchase them. After that they may, indeed, walk, run, patter up and down stairs, climb trees, get into trouble—but always without choice of their own. They give no council, offer no suggestions, put up no argument, enter no defense. The person who wears them does all this. But he, or a part of him, is likewise a product—the product of many, many forces and processes. One group of forces and processes is the school. But since this product of the school—this part or parcel of a person—is able after leaving school to do the most wonderful things and since these astonishing abilities are most of them his in spite of the school, we realize that something quite beyond industrial notions must be entertained.

Precisely what these non-industrial notions are it would, no doubt, be difficult to say. But since the real difference between the shoe factory and the school arises from the potentialities of their products, it would seem that the place to look for these non-industrial notions would be in the behavior of the product after it has been processed.

It is here that we believe the greatest waste in education lies. It is not primarily in the cost of instruction, nor is it in the relation of cost to achievement while in school or at the time of leaving school. *It is in what takes place afterwards.* Ask a Senior in college something about chemistry. Unless he has been specializing in chemistry, he will content himself with telling you that he "had" chemistry in his freshman year. Give a person in his thirties or forties a passage in German or Latin to read. Ten chances to one he can make nothing of it. He may tell you that he "took" Latin in high school or that he "studied" German in college; but so far as any immediate performance is concerned he is helpless. Ask an acquaintance about Chaucer, Shakespeare, Milton, or Wordsworth. He may tell you that he "majored" in English; yet ten to one he will make a sorry showing. The idea seems to be that if one has but studied a subject, one may rest content for the rest of one's life. As James Harvey Robinson has pointed out, these things which were "had" or "taken" in school days are all safely put away in the past tense, as one might put away a Paisley shawl in a cedar chest or a rope of pearls in a safety deposit vault. The expectation seems to be that the competence one once had will be imperishable or at least that, having once attained it, one has secured all the advantage it has to offer.

Here is where the great loss comes in—a loss compared with which every other loss in education is trivial. One of two things is wrong. Either the things we learn in school aren't worth learning or, if they are really valuable, we nevertheless wantonly waste them through neglect. There is, to be sure, a third alternative. The things we learn may have a disciplinary value. Having learned them we may have obtained all the value

they have to offer. Their value for us may be in a greater competence, a richer life, a finer personality. Not much stress is laid on the disciplinary value of studies today; and whether or not there is such a thing, it is certainly not as great as was once believed.

There appears to be no argument as to whether the offerings of the school are worth having. These things are all worth *something*. It is inconceivable that the wisdom of society could be so far wrong as to foist upon its dependents a purely meaningless preparation for life. Whether the course of study is the best possible course of study may, however, be seriously doubted. One way to stop waste, therefore, is to improve the curriculum.

But this is not the principal way. The greatest waste, and therefore the greatest opportunity to realize on our educational investment, lies in ourselves—lies in every "product" of the schools. Why should we prescribe history, literature, foreign language, science, and mathematics, for our children and never pay attention to them ourselves? If they are really good, if they represent the best that has been done and said, they are good for us. They are too good to lose.

Consider at what a small cost, after the first cost has been met, they can be kept. The foreign languages offer a good example. Suppose that at the time you passed your last examination in Latin you had selected from that language the motto, *Nulla dies sine linea*. Suppose that in conformity with that motto you had begun to read a little Latin every day. Suppose you had done this *ever since*. Your Latinity today would be something to be proud of.

But perhaps you set no value upon Latin. Very well, there are other things, are there not, which are worth retaining from your school days? The same motto will apply. If no day passes—even if no week or month passes—without some renewal of your early acquaintance with English literature, economics, philosophy, or science do you doubt that you will be a better man?

The things we studied in our childhood and youth *are* valuable. In the main they represent the race at its highest level of

thought and achievement. That we have forgotten this in the quest of gain or pleasure, that we have allowed the teachings of the school to pass from us is an irreparable loss. It is the greatest waste in education. B. R. B.

The JOURNAL has been exceedingly fortunate in securing from Professor Robert Francis Seybolt, of the School of Education, University of Illinois, a series of articles on certain aspects of Colonial education in America. The first of these appears in the present issue.

From time to time we have indicated editorially our belief that research workers in education are neglecting both the method and the field of history. Indeed, we are of the opinion that much of the instability and some of the crudity of our educational pronouncements have been due to a lack of historical perspective. The eye which is capable of taking the long look sees clearly. The facts of the present derive much of their meaning from the historical setting to which they belong—or, as we are more likely to say, from the trends of which they are a part.

The history of education, as history, has its appropriate methods of research. Professor Seybolt employs these methods. Moreover, he has utilized hitherto unexplored material. It is not strange, therefore, that he has brought to light a number of new and interesting facts concerning the schoolmasters of Colonial days. B. R. B.

Reviews and Abstracts

HANSON, WHITTIER LORENZ. *The Costs of Compulsory Attendance Service in the State of New York.* New York, Teachers College, Columbia University, 1924. 122 pp. (Teachers College, Columbia University, Contributions to Education, No. 158)

This study deals with the compulsory-education service of New York State, outside of New York City. It describes accurately the centralized scheme of state supervision, the methods of enforcement, the qualifications of attendance officers employed, and the moneys expended. A few specific recommendations are made.

Every experienced administrator will agree with the recommendation that the attendance officer be employed on full time, adequately paid, and for an area sufficiently large to justify the expense, is good sense.

The author seems to be of two opinions as to the nature of the attendance officer's duties. At one point, he emphasizes compulsory activities, giving elaborate statistical tables of the number of parents and truants arrested, the number of convictions, fines, and commitments, so that compulsion, as such, assumes great importance in the mind of the reader; in later discussion, it is urged that the attendance officer should be a combination of social worker, visiting teacher, mental expert, vocational guide, and last of all a submerged police officer. In this he reflects a more or less common attitude.

The first conception is too narrow; the second, too broad. "Social worker," "visiting teacher," "mental expert," "vocational guide" are terms significant of environment, retardation, mental defect or ailment, vocational advice, and vocational training. Each and all of these are concerns of the school system as a whole, and vitally affect courses of study, methods of teaching and professional preparation, and material equipment. They affect not merely the child who is an absentee, but every child in the community, from the time he first enters school. They involve the entire social organism, the cooperation of many agencies, and the support of an intelligent public opinion. Unless the school system is socially self-conscious; unless from each member of the school board, to the last classroom teacher appointed, it is alive to these implications and possibilities, little progress will be made. To expect that any field agent can do more than ameliorate extreme situations is futile.

Two statements of fact confirm this opinion. It is shown that the cause of the greatest amount of unlawful absence is the detention of children at home by their parents, either to perform relatively unimportant tasks, or to accompany parents on extended visits to relatives or friends. It would be

hard to find a better illustration of the lack of influence of the schools on the community. Again, largely preventable illness is the most important factor in lawful absence. Only a militant health program can meet this situation.

The popular notion of the school is still that of a place to which children are sent to be given conventionalized forms of information, all of which are not important. The parent and the community as well must be brought to see that the teaching process is complicated by numerous individual and environmental factors, whose early recognition is essential. Few are the children who do not need such consideration. Such a task can be performed only by those in authority, and its benefits should not be limited to the few. Attendance is to a large extent a reflection of prevailing local sentiment.

G. H. CHATFIELD

Bureau of Attendance
New York City Public Schools

HAMAIDE, AMELIE. *The Decroly Class: A Contribution to Elementary Education.* Translated from the French by Jean Lee Hunt. New York, E. P. Dutton and Company, 1924. 309 pp.

Dr. Ovide Decroly, a Belgian physician and psychologist, as a result of his work with abnormal children, has come to some definite conclusions upon the subject of education. These conclusions, arrived at independently, closely parallel those of our own Dr. Dewey. Dr. Decroly believes that education should concern itself with the present interests, needs, and activities of the child, that the school should be a "laboratorium" rather than an "auditorium."

Decroly schools have come to be known as "active" schools. We get the impression that they are places where children have things and do things, and where learning is an incident of living. They are attempting in continental Europe to do what the followers of Dewey are attempting in this country. We are, therefore, surprised at the apparent emphasis Dr. Decroly puts upon organization and method. The school employs what it calls its "Program of Associated Ideas." This is intended to give the child knowledge of himself and of his environment. It is organized about the primary needs of man, as the need for food, the need to protect oneself, the need of activity. These needs are taken as "centers of interest," and the work for an extended period or even for the year is built upon them. A special method is provided for attacking this subject-matter. Instead of the traditional "branches of study" Dr. Decroly has adopted three types of activity, "observation," "association," and "expression." Observation deals with the acquisition of knowledge by direct experience. Association covers that which the child secures indirectly from books or from other persons.

It seems to us that we have here a splendid foundation upon which to erect a highly formalized method, the very thing against which the movement is directed. Mlle. Hamaide's book offers evidence of some such tendency. We may well doubt if a "need for shelter" is a real felt need on the part of a healthy well-fed youngster, and if it is not rather a center of or-

ganization than a center of interest. In the type programs presented the principle of organization seems to be much more logical than psychological.

We must admit that in practice it does not seem so bad as it sounds. The teachers find ways for the natural impulses of childhood to express themselves. When shelter is the center of interest the children construct a playhouse. We would seem to have here an instance where the theory is bettered in practice. Be that as it may, Dr. Decroly's work is gaining recognition and a following. Therein, we fear, lies its danger. The spirit of the movement is, as ever, intangible; its "program of associated ideas" is so tangible and so much in evidence. We do not see how the good doctor is to escape the fate that befell Pestalozzi and Herbart at the hands of their friends and disciples.

VELORUS MARTZ

Indiana University

TOUTON, FRANK CHARLES. *Solving Geometric Originals.* New York, Teachers College, Columbia University, 1924. 114 pp. (Teachers College, Columbia University, Contributions to Education, No. 146.)

This is an investigation of the abilities shown by tenth-year high-school pupils in solving geometric originals. The raw materials used in the study were 2,800 plane-geometry examination papers, written by the better pupils in ninety high schools of New York State for the Regents Examination of June, 1918. Attention was confined to the solutions of nine originals proposed in the examination. The findings of the study are based upon a very detailed analysis of the work done in solving each exercise, setting forth the facts and concepts used, the frequency of occurrence of each, and the correct or incorrect use made of each.

Teachers of high-school mathematics and students preparing for the teaching of high-school mathematics will read with interest the suggestions for improved methods, that are derived by the author from his study of solving geometric originals, and will profit by their use in the classroom.

J. A. FOBERG

Department Public Instruction, Pennsylvania

BARBER, HARRY C. *Teaching Junior High-School Mathematics.* New York, Houghton Mifflin Company, 1924. 137 pp.

The past decade has witnessed the advent of some eight or ten sets of textbooks in mathematics prepared for the pupils of the junior high school. Books and periodical articles dealing with the junior high school, its opportunities and responsibilities, have been many. Experimental work by Thorndike and the investigation made under the direction of the National Committee on Mathematical Requirements recently have resulted in many concrete suggestions as to the method and content of mathematics courses, a number of which establish contact with the junior high school.

The reader will find many valuable suggestions in the book. The author's insistence that mathematics should be a series of meaningful experiences to the pupil, his frequent discussion of significant figures in computation, and

his numerous references to checking and approximations, appeal to the reviewer as especially good.

The book unfortunately lacks scientific tone. The recommendations are not supported by experimental evidence, and dogmatic assertions abound. Cases in point are: "The grouping of digits is nearly always practiced in efficient addition" (p. 19), "In subtraction the additive method should be stressed" (p. 20), "The term 'percent' is an entirely superfluous term and we should be better off if we did not use it at all" (p. 25), "It is quite possible to teach the children to factor $a^2 - b^2$, but . . . . we have accomplished nothing when it is done" (p. 88), and "No subject in the high-school curriculum is making more progress than algebra" (p. 95).

Teachers of mathematics in the junior high school should read Mr. Barber's book and critically reflect upon his recommendations. They should then undertake to evaluate their own practices. It is to be hoped that they may soon have the advantage of more books on the teaching of junior high-school mathematics.

R. L. MORTON

Ohio University

ANDRUS, RUTH. *A Tentative Inventory of the Habits of Children from Two to Four Years of Age.* New York, Teachers College, Columbia University, 1924. 50 pp. (Teachers College, Columbia University, Contributions to Education, No. 160)

Appreciating the magnitude of the task undertaken, those who are concerned with pre-school education welcome *A Tentative Inventory of the Habits of Children from Two to Four Years of Age*, by Dr. Ruth Andrus. Dr. Andrus has developed an inventory of habits, based on the data secured by sixty-seven members of the class in kindergarten-primary education during 1,050 hours of observation on fifty-two children, in the controlled conditions of four nursery schools. A twofold use of the inventory is suggested by Dr. Andrus: (1) "as a means of training teachers in more accurate observation of children and in knowledge of the habits and educability of children from two to four," and (2) "as an instrument for the appraisal of the abilities of children of these ages with possible diagnostic and prognostic value."

By statistical proof and by unanimous expression of the workers' opinions, the method of observation outlined gives evidence of its value in training. A question of practical importance, however, arises at the suggestion that the inventory be used by heads of nursery schools, since three hours of undivided attention must be given to each child, "anything less than three hours decidedly lowers the scores." The value of the inventory depends on the validity of composite scores as a basis for comparison. A nursery-school group is of necessity so small that a few children of neurotic disposition, of defective mentality, or of unusual type of training would seriously affect the group scores of the school. It seems, therefore, that standard scores on the various habits must be made, as Dr. Andrus suggests, on a large number of children, and, also, should be made near entrance and after training. In

other words, if there is no regard in the standardization to the length of time the children have been in the school, the value of the norms from the point of view of diagnosis and prognosis will be seriously affected. The traits scored, we believe, are in large measure affected by nursery-school training. In fact, that these traits are affected, even in a short time, during these early years, is the *raison d'être* of the schools. We may be wrong in the assumption, but we must not ignore it.

ELIZABETH LORD

Yale University

Publications Received, August 15 to September 15

ALDREDGE, EDNA M. and MCKEE, JESSIE F. *Folklore Friends; Stories to Read and Color; for Second and Third Grades.* Cleveland, Ohio, The Harter School Supply Company, 1925. 64 sheets. (Silent Reading Seat Work). Per set, $.50.

BABCOCK, LESLIE EDWARDS. *Elements of Field Artillery.* Princeton, N. J., Princeton University Press, 1925. 870 pp. $6.00.

BAKER, JOSEPHINE TURCK. *Correct Standardized Pronunciation of Words in Everyday Use; a Dictionary.* Evanston, Ill., Correct English Publishing Company, 1919. 636 pp. $2.50.

BEURET, GEORGETTE. *When I Was a Girl in France.* Boston, Lothrop, Lee and Shepard Company, 1925. 208 pp. (Children of Other Lands Books). $1.25.

BYRD, HOMER J. *Silent Reading Cards.* Chicago, A. Flanagan Company, 1925. Primary. 32 cards. Per set, $.35. Intermediate. 32 cards. Per set, $.35.

BYRNE, HENRY EDWARD. *Combination Shorthand.* Dallas, Texas, Byrne Publishing Company, 1924. 43 pp. $1.50

The Child, the Clinic, and the Court. New York, New Republic, 1925. 344 pp. $1.00.

COFF, ROBERT REMINGTON. *The High School Slide Rule, with Instructions for Its Use.* Boston, The Palmer Company, 1925. $.50.

COLEMAN, BESSIE BLACKSTONE, and others. *The Pathway to Reading.* New York, Silver, Burdett and Company, 1925. Second Reader. 186 pp. $ .76. Third Reader. 248 pp. $ .84.

COLLINS, A. FREDERICK. *The Boy Scientist.* Boston, Lothrop, Lee and Shepard Company, 1925. 447 pp. $2.50.

COOKE, EDMUND VANCE. *Mark and May at Work and Play; Pictures to Color, Verses to Learn and Recite.* Cleveland, Ohio, The Harter School Supply Company, 1924. 12 pp. (Harter's Happy Books for Girls and Boys). $.20.

COOKE, EDMUND VANCE. *Playmates of Other Nations; Pictures to Color; Verses to Learn and Recite.* Cleveland, Ohio, The Harter School Supply Company, 1924. 16 pp. (Harter's Happy Books for Girls and Boys). $.20.

DAVIS, EDNA CLARK. *Miss Polly Wiggles.* Boston, Lothrop, Lee and Shepard Company, 1925. 335 pp. $1.50.

DEMAY, AMY J. *Supplementary English Cards; for Intermediate Grades.* Chicago, A. Flanagan Company, 1925. 48 cards. Per set, $.40.

DEWITT, M. E. *EuphonEnglish in America.* New York, E. P. Dutton and Company, n. d. 177 pp. $1.20.

DOW, GROVE SAMUEL, and WESLEY, EDGAR B. *Social Problems of Today.* New York, Thomas Y. Crowell Company, 1925. 337 pp. $2.00.

DOWNING, ELLIOT R. *Teaching Science in the Schools.* Chicago, University of Chicago Press, 1925. 185 pp. (The University of Chicago School Science Series). $2.00.

EDWARDS, A. S. *The Psychology of Elementary Education.* New York, Houghton Mifflin Company, 1925. 333 pp. (Riverside Textbooks in Education). $2.00.

FABRE, JEAN-HENRI. *Les ravageurs.* Ed. by Edward Manley. New York, Benj. H. Sanborn and Company, 1923. 215 pp. $1.00.

FOSTER, WILLIAM. *Introduction to General Chemistry.* Princeton, N. J., Princeton University Press, 1925. 647 pp. $3.50.

FOWKES, HENRY L. and JONES, EDGAR S. *School Essentials in Practical Agriculture.* Boston, Educational Publishing Company, 1925. 394 pp. $1.44.

GILES, J. T. *Giles Recitation Score Card; Manual of Directions.* Yonkers-on-Hudson, N. Y., World Book Company, 1925. Specimen set $.10.

GOLDSTEIN, MABEL, and GOLDSTEIN, FLORENCE. *Picture Making.* Cleveland, Ohio, The Harter School Supply Company, 1924. 8 cards. (Silent Reading Seatwork for Primary Grades). Per set, $.40.

GOLDSTEIN, FLORENCE F. *Classifying Words.* Cleveland, Ohio, The Harter School Supply Company, 1924. 8 cards. (Silent Reading Seatwork for Primary Grades). Per set, $.40.

HAMILTON, CLARENCE G. *Piano Music; Its Composers and Characteristics.* Boston, Oliver Ditson Company, 1925. 233 pp. $2.00.

Hart's Language Helps for Grammar Grades; for Blackboard Work, Oral Recitation or Study Hour. New York, Educational Publishing Company, 1903. Synthesis. 50 cards. $.30. Compound and Complex Sentences. 50 cards. $.30. Prepositional Phrases. 50 cards. $.30. Participles, Adjectives, and Verb Phrases. 50 cards. $.30. Relative Pronouns. 50 cards. $.30. Noun Clauses. 50 cards. $.30.

HAWKSWORTH, HALLAM. *A Year in the Wonderland of Birds.* New York, Charles Scribner's Sons, 1925. 245 pp. (Strange Adventures in Nature's Wonderlands). $1.60.

JORDAN, EDWIN O. *A Text-Book of General Bacteriology.* 8th Ed. Philadelphia, W. B. Saunders Company, 1924. 752 pp. $5.00.

KEEL-SMITH, H. *Blackboard Story-Telling; Self-Instruction Drawing.* Chicago, Rand McNally and Company, 1925. 157 pp. $1.75.

KING, MYRA. *Geography Games; a Method of Teaching Geography in Primary Grades.* Boston, Educational Publishing Company, 1925. 151 pp. $.75.

LABICHE, EUGÈNE, and MARTIN, EDOUARD. *Le voyage de monsieur Perrichon.* Ed. by Robert Fouré and Hélène Fouré. Philadelphia, The John C. Winston Company, 1925. 207 pp. (The Winston Modern Language Series).

LAING, MARY E. and EDSON, ANDREW W. *Work and Play.* New York, Benj. H. Sanborn and Company, 1924. 124 pp. (The Edson-Laing Series). $.72.

LEATHERMAN, ZOE EMILY, and DOLL, EDGAR A. *A Study of the Maladjusted College Student.* Columbus, Ohio, Psychological Clinic, The Ohio State University, 1925. 56 pp. (The Ohio State University. University Studies. Vol. 2, No. 2. July 30, 1925).

LYON, BERTRAND. *Practical Public Speaking.* Boston, Lothrop, Lee and Shepard Company, 1925. 436 pp. $2.50.

MCMURRY, CHARLES A. *Large Projects in Geography.* Richmond, Va., Johnson Publishing Company, 1925. 222 pp. (Practical Teaching, Book I). $2.00.

MAŽURANIĆ, IVAN BERLIĆ. *Croatian Tales of Long Ago.* Trans. by F. S. Copeland. New York, Frederick A. Stokes Company, n. d. 259 pp. $3.00.

MERTON, ELDA L. *Study-Period Projects; Test and Practice Exercises in Silent Reading.* Chicago, Laidlaw Brothers, 1925. Grade I. 16 cards. Per set, $.32. Grade II. 30 cards. Per set, $.44. Grade III. 16 cards. Per set, $.44. Teachers Handbook for Grades I, II, and III. 52 pp. $.36.

MYERS, GARRY CLEVELAND. *Reading and Writing Decimals; for Fifth and Sixth Grades; Review Seventh Grade.* Cleveland, Ohio, The Harter School Supply Company, 1925. 8 cards. (Self-Supervised Seat Work). Diagnostic Testing Pad to Accompany Lessons. Per pad of 50 sheets, $.20.

MYERS, GARRY CLEVELAND. *Self Teaching Cards and Diagnostic Testing Pad; for First, Second, and Third Grades; Review by Fourth and Fifth Grades.* Cleveland, Ohio, The Harter School Supply Company, 1925. (Self-Supervised Seat Work). Addition. 100 cards. Per set, $.50. Addition Test. Per pad of 50 sheets, $.15. Subtraction. 100 cards. Per set, $.50. Subtraction Test. Per pad of 50 sheets, $.15. Multiplication. 100 cards. Per set, $.50. Multiplication Test. Per pad of 50 sheets, $.15. Division. 100 cards. Per set, $.50. Division Test. Per pad of 50 sheets, $.15.

PALMER, CLAUDE IRWIN, and LEIGH, CHARLES WILBER. *Plane and Spherical Trigonometry with Five-Place Logarithmic and Trigonometric Tables, with Explanatory Chapter.* 3d. Ed., Rev. and Enl. New York, McGraw-Hill Book Company, 1925. 357 pp. $2.50.

PATERSON, DONALD G. *Preparation and Use of New-Type Examinations; a Manual for Teachers.* Yonkers-on-Hudson, N. Y., World Book Company, 1925. 87 pp. $.60.

PATTERSON, S. G. *Intermediate French Prose Composition and Conversation Builder for Use in Colleges and High Schools.* New York, Benj. H. Sanborn and Company, 1925. 261 pp. $1.12.

PAYNE, E. GEORGE. *We and Our Health.* New York, The American Viewpoint Society, 1924-25. Book I. 86 pp. $.80. Book II. 133 pp. $1.00. Book III. 192 pp. $1.14. Suggestions to Teachers in the Use of Books I-IV. 31 pp.

PAYNE, E. GEORGE, and SCHROEDER, LOUIS C. *Health and Safety in the New Curriculum; a Teacher's Training Book.* New York, The American Viewpoint Society, 1925. 318 pp. $2.00.

PETERSON, HARVEY ANDREW. *Experiments and Exercises in Educational Psychology.* Bloomington, Ill., Public School Publishing Company, 1925. 256 pp. $1.80.

PETERSON, JOSEPH. *Early Conceptions and Tests of Intelligence.* Yonkers-on-Hudson, N. Y., World Book Company, 1925. 320 pp. (Measurement and Adjustment Series). $2.16.

POPE, ALEXANDER. *Poetical Works.* Ed. by A. W. Ward. New York, Thomas Y. Crowell Company, n. d. 573 pp. $1.75.

POTTER, ANDREY A. *Farm Motors; Gas and Steam Engines, Hydraulic and Electric Motors, Traction Engines, Automobiles, Animal Motors, Windmills.* 3d. Ed., Rev. and Enl. New York, McGraw-Hill Book Company, 1925. 299 pp. (Agricultural Engineering Series). $2.50.

POULSSON, EMILIE. *Father and Baby Plays.* Boston, Lothrop, Lee and Shepard Company, 1925. 98 pp. $1.50.

Practical Drawing; Art Education Edition. Dallas, Texas, Practical Drawing Company, n. d. Books I-II. 47 pp. each. $.20 each. Books III-VIII. 47 pp. each. $.25 each.

Practical Writing Course. Rev. Dallas, Texas, Practical Drawing Company, 1924. Books I-VII. 32 pp. each. $.10 each. Teacher's Manual. 96 pp. $.40.

Problems in Mental Testing, with Special Reference to the Administration of Group Intelligence Testing; Special Preliminary Edition. Bloomington, Ill., Public School Publishing Company, 1925. Unpaged. (Educational Problem Series, No. 9). $.75.

The Pupil's Designer for Original Designing and Color Work. Cleveland, Ohio, The Harter School Supply Company, 1924. 16 cards, 500 tablets. Per set, $.50.

PYLE, HOWARD. *Men of Iron.* New York, Harper and Brothers, 1919. 327 pp. $.90.

REIGNER, CHARLES G. *Applied Typing with Rowe Shorthand Notes.* Baltimore, The H. M. Rowe Company, 1925. 136 pp. $1.40.

RICHARDSON, W. P. and REED, JAMES C. *Rowe's Commercial Law.* Ed. by Edwin Leibfreed and Harry M. Rowe. Baltimore, The H. M. Rowe Company, 1924. 364 pp. $1.50.

ROSS, EDWARD ALSWORTH. *Civic Sociology; a Textbook in Social and Civic Problems for Young Americans.* Yonkers-on-Hudson, N. Y., World Book Company, 1925. 365 pp. $1.80.

ROSS, J. WALTER. *Ross' Lessons in Touch Typewriting, Including Progress Card.* Baltimore, The H. M. Rowe Company, 1924. 80 pp. $.80.

ROUSSEAU, JEAN-JACQUES. *Selections from the Works of Jean-Jacques Rousseau.* 2d Ed., Rev. and Enl.; Ed. by Christian Gauss. Princeton, N. J., Princeton University Press, 1924. 222 pp. $1.50.

ROWELL, PERCY E. *Elementary General Science, with Experiments.* Berkeley, Calif., The Author, 1914. Book I. 198 pp. $1.25.

SHERIDAN, RICHARD BRINSLEY and GOLDSMITH, OLIVER. *The Rivals* and *She Stoops to Conquer.* Ed. with an Introduction and Notes by Mabel A. Bessey. New York, Charles E. Merrill Company, 1925. 366 pp. (Merrill's English Texts). $.75.

SMITH, LAURA ROUNTREE. *The-Pixie-in-the-House.* Chicago, A. Flanagan Company, 1925. 130 pp. $.72.

SMITH, LAURA ROUNTREE. *The-Pixie-on-the-Farm.* Chicago, A. C. McClurg and Company, 1922. 138 pp. $.72.

STEFANSSON, VILHJALMUR. *Northward Ho! An Account of the Far North and Its People.* Selected and Adapted for Boys and Girls by Julia Augusta Schwartz. New York, The Macmillan Company, 1925. 181 pp. $1.25.

STEVENSON, ROBERT LOUIS. *Poems.* New York, Thomas Y. Crowell Company, 1925. 358 pp. $1.75.

SWEARINGEN, ESTELLE MARGARET. *Pickaninny.* New York, Duffield and Company, 1925. 132 pp. $1.25.

THOMAS, STANLEY. *Bacteriology; a Textbook on Fundamentals.* 1st Ed. New York, McGraw-Hill Book Company, 1925. 201 pp. $2.50.

THORNDIKE, EDWARD LEE. *The Thorndike Junior High School Mathematics.* Chicago, Rand McNally and Company, 1925. Book I, Grade Seven. 194 pp. Book II, Grade Eight. 196 pp. (The Thorndike Series of Junior High School Mathematics). $.80 each.

VAN WAGENEN, M. J. *A Teachers' Manual in the Use of Accomplishment Educational Scales.* Bloomington, Ill., Public School Publishing Company, n. d. 187 pp. $1.50.

WALLIN, J. E. WALLACE. *Studies of Mental Defects and Handicaps.* Oxford, Ohio, Miami University, 1924. 177 pp. (Miami University Bulletin, Series 22, No. 5. January, 1924). $.75.

WHITTEMORE, LUTHER DENNY. *Elementa Prima.* Rev. Ed. Philadelphia, The John C. Winston Company, 1925. 554 pp. $1.52.

WIESE, E. G. and COOVER, J. E. *The Wiese-Coover Kinesthetic Method of Learning Touch Typing.* Baltimore, The H. M. Rowe Company, 1924. 105 pp. $2.25.

WINSLOW, CHARLES-EDWARD AMORY, and WILLIAMSON, PAULINE BROOKS. *The Laws of Health and How to Teach Them.* New York, Charles E. Merrill Company, 1925. 354 pp. $1.60.

WOOLLEY, PAUL V. *A Guide to the Study of Woodworking; a Handy Reference for Woodworkers, Teachers and Students of High Schools, Colleges and Industrial Schools.* Peoria, Ill., The Manual Arts Press, 1925. 61 pp. $.90.

WORST, EDWARD F. *Pictures and Stories for Silent Reading; for Primary Grades.* Chicago, A. Flanagan Company, 1925. Per envelope, $.25.

WORST, EDWARD F. *Worst's Picture Number Cards; for Primary Grades.* Chicago, A. Flanagan Company, 1925. 12 cards. Per envelope, $.20.

WORST, EDWARD F. *Worst's Vowel Family Cards; for First Grade.* Chicago, A. Flanagan Company, 1925. 12 cards. Per envelope, $.20.

YOUNG, ELEANOR JONES. *Better Speech Game; for Grades Three to Five.* Chicago, A. Flanagan Company, 1925. Per set, $.35.

Zaner Method Handwriting Scales and Standards. Columbus, Ohio, Zaner and Bloser Company, 1917. Grades I and II. Per dozen, $1.32. Grades III and IV. Per dozen, $1.32. Grammar Grades, High Schools, etc. Per dozen, $1.32.

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

Mr. Leon O. Smith, assistant superintendent of schools, in charge of research at Omaha, taught during the summer session of the San Diego State Teachers College. He offered courses in school administration and in the education of gifted children.

Dr. Virgil E. Dickson has resigned from the assistant superintendency of the Oakland public schools. He is now dividing his time between the University of California and the Berkeley public schools. His university title is that of Lecturer in Education. In the Berkeley system, he is Assistant Superintendent and Director of Research.

Many of our readers are interested in anthropometric measurements but often do not regularly read material which falls in that field. *Genetic Studies of Genius*, Volume I, edited by Dr. L. M. Terman and published by the Stanford University Press, contains a chapter on "Anthropometric Measurements of a Group of Gifted Children" by Dr. Bird T. Baldwin. Reference is given here because of the facts stated above and because Dr. Baldwin, one of our members, is a well-known authority in the field.

The Maladjusted College Student (Ohio State University Studies, Volume II, Number 2) reports a study made at Ohio State University by Zoe Emily Leatherman and Edgar A. Doll. The study involves the history of the mental-testing movement, the administrative use of test results, an analysis of the problem of maladjusted college students with records from the office of the Dean of Women, digests of cases, and so forth. We believe that it is a genuine contribution to the field of college administration by the way of the psychological clinic.

Professor Roy Ivan Johnson of Stephens College, Columbia, Missouri, has been appointed to the Division of Research of the St. Louis public schools. He began his services September 1. Professor Johnson has lately been associated with Dr. Charters in the Stephens College Department of Research where he was in charge of the Division of English Composition.

The regular staff of the College of Education, Ohio State University, was supplemented during the Summer Session by the following persons in the Department of School Administration: W. W. Aikin, St. Louis; F. E. Ayer, University of Washington; S. P. Capen, University of Buffalo; J. J. Oppenhiemer, Stevens College, Missouri; Livingston C. Lord, Eastern Illinois State Normal School; W. W. Theisen, assistant superintendent, Milwaukee.

The visiting professors in the Department of Principles and Practice were: M. C. Otto, University of Wisconsin; Eva May Luse, Iowa State Teachers College; Adelaide M. Ayer, Columbia University; Ralph Bonz, Mt. Holyoke; and Henry Neumann, Ethical Culture School.

A special course of lectures on "The Place of the Schools in the Social Organization" was given by Superintendent C. R. Reed, Akron, Ohio; A. E. Morgan, president, Antioch College; Payson Smith, Massachusetts Commissioner of Education; Superintendent C. S. Meek, Toledo, Ohio; Acting Superintendent E. D. Roberts, Cincinnati, Ohio; and Superintendent R. G. Jones, Cleveland.

Luther Parker, acting division superintendent of Cabanatuan, Philippine Islands, has sent us a considerable amount of circular material emphasizing the work in character-building that is being carried on in the schools of his district. Mr. Parker went to the Philippines in 1901 and established one of the first groups of self-governing students in the Philippine Islands. His circulars show the use in this work of the Junior Red Cross, Better Health Clubs, The Home Improvement Club, Band of Mercy, Safety First League, Junior Women's Club, and Pupils' Self-Government Councils. Copies of letters from children, teachers, and principals express enthusiastic appreciation of work that is being done.

Study-Period Projects by Elda L. Merton, assistant superintendent of schools, Waukesha, Wisconsin, is a new set of silent-reading exercises published by Laidlaw Brothers. The material is especially attractive in appearance, for it consists of colored pictures, illustrating simple scenes from well-known children's stories along with word, phrase, and sentence groups, so arranged as to be used with the pictures in picture matching, booklet making, and the like. Perhaps the best feature of the series is the fact that certain of the exercises actually require thinking on the part of the child. The problems cannot be worked out, nor correct answers obtained by mere copying of words from the written material. Thinking is necessary.

An examination of the exercises makes one wish he could be a pupil in a primary grade where this delightful material was used.

Seventeen cities in the United States of fifty thousand to one hundred thousand population make their regular promotions in the elementary grades annually. These seventeen are: Mobile, Alabama; Waterbury, Connecticut; Augusta, Maine; Haverhill, Massachusetts; Holyoke, Massachusetts; Lawrence, Massachusetts; Lynn, Massachusetts; Somerville, Massachusetts; Saginaw, E. S., Michigan; East Orange, New Jersey; Atlantic City, New Jersey;

Canton, Ohio; Allentown, Pennsylvania; Altoona, Pennsylvania; Bethlehem, Pennsylvania; Wilkes-Barre, Pennsylvania; Pawtucket, Rhode Island.

Superintendent Laramy, of Altoona, Pennsylvania, says:

We changed this year from a semiannual to annual promotion after seven-years trial. Parents and students have objected greatly to the so-called mid-year classes. Four and one-half months with long vacation following for such subjects as Latin, algebra, and so forth is decidedly poorer than nine and one-half months before vacation.

What the Schools Cost (Report No. 6 of the Superintendent of Schools of Lincoln, Nebraska) considers present and past school costs in Lincoln and draws some comparisons regarding Lincoln's expenditures with those of other cities. Perhaps the most significant phase of the brief report is the comparison of school expenditures with those of the city fire department, city police department, and so forth. Another important section points out that while the school district receives practically 58 percent of the general property tax dollar, it receives only 5 percent of its revenue from other sources, while the city receives 54 percent of its revenue from other sources. It re-emphasizes what has been pointed out frequently, that comparisons as to the distribution of tax receipts may be quite misleading unless other facts are known.

It has become quite common practice for city high schools to issue an annual which glorifies the seniors, the members of the athletic teams, and dramatic clubs and incidently gives some indication of other activities of the schools. It is rather rare for a county system to present a similar publication. Portage County, however, in its *Speedometer*, Commencement Number, 1925, has approximated pretty closely the high-school annual of a fair-sized city. Its twenty schools with 195 graduates are well represented, not only in the senior classes and athletics, but in other types of activities. We suspect that Superintendent O. E. Pore, though listed as only advisory editor, contributed considerably toward the success of the venture, though full credit must be given to everyone who assisted in the making of the book.

Eighth-Grade Examinations and Admission to High School[1]

In many communities eighth-grade pupils are required by law to pass a uniform examination set by state officials before they are admitted to high school. This practice was instituted at a time when the examination was about the only available instrument for testing ability to do high-school work. It has lost ground to a great degree, but still remains as a hurdle in the path of many boys and girls attending either one-room country schools or schools located in villages. It seems that some other means could be found whereby the working ability of pupils might be better judged, the adoption of which would free the teacher from the necessity of spending so much time in preparing pupils to meet the examination. This investigation was undertaken to determine whether or not such a uniform examination, the work done in the eighth grade, or a

[1] This article summarizes a Master's thesis written under the direction of A. A. Douglass.

battery of educational tests is most likely to foretell success during the first year of high school.

The following data were secured for two hundred eighth-grade pupils who attended school in small school systems: the average of the final grades earned in each of the eighth-grade subjects; the average of the grades received in a uniform state eighth-grade examination; and the scores made in the Holley Vocabulary, the Thorndike-McCall Silent Reading, the Ayres Silent Reading, and the Stone Reasoning Tests. Comparisons were then made and correlations worked out to determine which of these corresponded most closely with an average of the grades received during the first semester in high school.

TABLE 1. PERCENT OF PUPIL DISPLACEMENT WHEN GROUPED ACCORDING TO SUGGESTED METHODS OF ADMISSION TO HIGH SCHOOL AND ACCORDING TO HIGH-SCHOOL GRADES

	Percent of Displacement					
	Teachers' Estimate	State Examination	Holley Vocabulary	Ayers Reading	Thorndike-McCall Reading	Stone Reasoning
(1)	(2)	(3)	(4)	(5)	(7)	(8)
Same group	36.2	32.3	25.4	25.2	26.6	22.1
Higher groups	32.3	29.1	40.8	41.0	37.4	50.8
Lower groups	31.5	38.6	33.8	33.8	36.0	27.1
Displaced one place	41.7	50.3	48.6	32.4	46.7	43.4
Displaced more than one place	22.1	17.4	26.0	42.4	26.7	34.5
Placed in same group and displaced one place	77.9	82.6	74.0	57.6	73.3	65.5

As a first step, a series of ranks was arranged for each of the scores or grades. Approximately 15 percent of the pupils were placed in Group I, indicating greatest ability; 20 percent in Group II as ranking next or slightly lower; 30 percent, in Group III, representing the average; 20 percent, in Group IV, being slightly below average; and 15 percent, in Group V, representing the pupils of least ability.

Table I shows how each of the tests, the eighth-grade average, and the state examination average, grouped the pupils with respect to ability to do high-school work.

This table shows that more pupils are given their correct high-school rating by the eighth-grade average than by any of the other methods used. The state examination is, however, a close second. But since a fraction of one percent was sufficient in some cases to place a pupil, it seems more just to consider the number placed in the same group and in one group above or below as signifying the best method of placement. When this method is used, the state examination becomes the best method of selection, with the eighth-grade average second.

The next step was to determine the best method of selecting high-school students as shown by the coefficients of correlation between the average grade made by each pupil in high school and the grades or scores made on each of the other bases. The results are shown in Table II.

TABLE II. COEFFICIENTS OF CORRELATION BETWEEN AVERAGE HIGH-SCHOOL GRADE AND SUGGESTED METHODS OF ADMITTING PUPILS TO HIGH SCHOOL

(1)	r (2)
Teachers' estimate	55.70
State examination	49.62
Holley vocabulary	59.89
Thorndike-McCall	46.67
Stone reasoning	32.20
Ayres reading	19.08

This plan gives a different ranking of methods than that secured by use of the growing plan shown in Table I. The Holley Vocabulary Test stands first, with the eighth-grade average second, and the state examination third, although its superiority over the Thorndike-McCall Reading Scale is not marked.

Table III shows the correlations between the state examination and each of the other proposed methods of selection.

TABLE III. COEFFICIENTS OF CORRELATION BETWEEN THE AVERAGE GRADE IN THE STATE EXAMINATION AND EACH OF THE SOURCES NAMED IN LEFT-HAND COLUMN

(1)	r (2)
Teachers' estimate	71.5
Stone reasoning	51.7
Holley vocabulary	47.4
Thorndike-McCall	45.8
Ayres reading	41.7

The correlation between the grades earned in the eighth grade and those received in the state examination are strikingly high. This is undoubtedly due in a large measure to the fact that much of the work done in the eighth grade is in preparation for the state examination. The teachers know the ground that will be covered and the type of questions that will be asked. They feel that their success as teachers depends upon the number of their pupils who pass these examinations and, therefore, devote much time to drill and review, often basing their tests upon old sets of state examination questions. It is little wonder that the grades they assign to their pupils correspond closely to those received in the state examination.

According to the foregoing data, the state examination is a rather accurate method of determining probable success of pupils in high school. Its superiority over teachers' judgments is slight, however, so that it seems that eighth-grade pupils from village schools may safely be allowed to advance upon the recommendations of their teachers alone. This would effect a saving in time and money expended in preparing, distributing, and grading examination papers. More important than this, it would free the teachers from the necessity of spending such a large amount of effort in preparing their pupils for the examination and would allow them to devote this time and energy to work more educative in value.

JOHN B. STACKHOUSE

State College of Washington